

THE REORDERING OF MORPHEMES

Marianne Mithun
University of California, Santa Barbara

Several kinds of proposals have been put forth to explain the relative sequencing of morphemes we find in languages. Some are purely synchronic, such as Baker's 1985 Mirror Principle that morphological derivations must directly reflect syntactic derivations. According to his analysis, for example, if a sentence in some language is analyzed as the result of first an applicative process (changing 'The zebras handed the crowbar to the girl' to 'The zebras handed the girl the crowbar') and then passivization (changing 'The zebras handed the girl the crowbar' to 'The girl was handed the crowbar'), applicative and passive affixes will be added to the the verb in that order. Other explanations of morpheme order, such as that proposed in Rice 1991, have focused on the relative semantic or grammatical scope of morphemes. Thus in a word like *[[[beauti]ful]ly]*, the outer suffix *-ly* has scope over the full adjective stem *beauti-ful* to its left, deriving an adverb from the adjective. The inner suffix *-ful* has scope over just the noun root *beauty* to its left, deriving an adjective 'full of *beauty*'. Bybee (1985: 33-5) accounts for morpheme order in terms of 'relevance': 'the semantic relevance of an affix to a stem is the extent to which the meaning of the affix directly affects the meaning of the stem' (1985: 4). More relevant affixes are predicted to occur closer to the root. Her prediction can be illustrated with markers of aspect and tense. A shift in aspect can significantly alter the nature of an event: sleeping is a different kind of activity than its inceptive counterpart falling asleep. Tense, by contrast, simply situates an event as a whole at some point in time, with little effect on its essence: sleeping today is much the same kind of activity as sleeping yesterday. Aspect affixes are accordingly predicted to occur inside of tense markers within verbal morphology.

Yet we know that morpheme order is not usually the result of spontaneous on-line decisions at each moment of speech. Morphological structures are built up over time, as independent words are gradually reduced to dependent affixes through processes of grammaticalization. Diachronic considerations were appropriately brought into the discussion of morpheme order with Givon's provocative maxim that 'today's morphology is yesterday's syntax' (1971: 413), further discussed by Comrie (1980). Bybee proposes that 'the order of morphemes is in large part a result of the order of words in the verb phrase, and the frequency of occurrence of certain categories as verbal inflections is a reflex of their frequent occurrence contiguous to the main verb' (1985: 41). Of course a full sentence is not reduced to a morphologically complex word in a single operation. Morphological structures usually develop step by step, category by category. Morpheme order might thus be better seen as a reflection of the historical sequence of grammaticalization of affixes.

The various synchronic and diachronic accounts of morpheme order need not be at odds. Synchronic analyses of morpheme order cast in terms of derivational processes could, for example, reflect the historical order of the grammaticalization of these processes. These might in turn mirror their relative scope or relevance. Such relations might have been the basis underlying earlier word order. Comparative evidence within many language families indicates that morpheme order often does reflect the sequence of grammaticalization of affixes: those affixes closest to the root are indeed the oldest, and those on the periphery of words can be seen to be more recent additions. The picture is more complex, however. Once built up, morphological structures are not

immune to further change. A variety of processes may alter morpheme order after attachment has occurred. (Discussions of some of these changes are in Haspelmath 1993, Mithun 1995, and Harris 1997.) In what follows we will see a kind of reordering that can be stimulated by a shift in status of certain markers from derivational to inflectional categories.

1. Types of morpheme order: layered versus templatic morphology

A distinction sometimes drawn in work on morpheme order is that between 'layered' or 'hierarchical' structures on the one hand, and 'templatic' or 'slot and filler' structures on the other. In layered structures, words are analyzed as having been built up step-by-step, affix-by-affix, with each morphological process creating a new stem that can serve as a base for another, as in *[[beauti]ful]ly* discussed above. Such structures are elaborately developed in the Eskimoan languages, illustrated here with material from Central Alaskan Yup'ik. Examples have been drawn from the speech of Elena Charles, Elizabeth Ali, and George Charles of Bethel, Alaska.

Both nouns and verbs in Yup'ik consist of an initial root, any number of derivational suffixes, and a final inflectional ending.



FIGURE 1: YUP'IK MORPHOLOGICAL ORDER

The inventory of suffixes is extremely rich; Jacobsen (1984) has identified over 450 derivational suffixes in Yup'ik and even more inflectional suffixes. A root may be inflected directly to form a word, or it may serve as the input to a derivational process which creates a new stem that can in turn be inflected as a word, and so forth. (Yup'ik examples are presented in the practical orthography.¹)

(1) Yup'ik layered morphology: George Charles, speaker

- a. *ayagtua*
ayag-tu-a
go-INDICATIVE:INTRANSITIVE-1:SG
'I'm going'
- b. *ayagyugtua*
ayag-yug-tu-a
go-want-INDICATIVE:INTRANSITIVE-1:SG
'I want to go'
- c. *ayagyuumiitua*
ayag-yug-umi-ite-u-a
go-want-be:in:state-not-INDICATIVE:INTRANSITIVE-1:SG
'I don't want to go'
- d. *ayagyuumiitqapiartua*
ayag-yug-umi-ite-qapiar-tu-a

go-want-be:in:state-not-really-INDICATIVE:INTRANSITIVE-1:SG
'I really don't want to go'

The Yup'ik suffixes do not always occur in the same order with respect to each other. Ordering differences can reflect differences in semantic or grammatical scope. Each added suffix qualifies the preceding stem as a whole, rather than just the root or the preceding suffix. In (2)a, for example, the stem 'giant' is first derived (from 'person-big'), then qualified by 'little', while in (2)b, the stem 'midget' is first derived (from 'person-little'), then qualified as a unit by 'big'.

(2) Yup'ik scope alternations: Elizabeth Ali, speaker

a. *yugpacuaq*
yug-pag-cuar
person-big-little
'little giant'

b. *yucuarpak*
yug-cuar-pag
person-little-big
'big midget'

In (3)a, the suffix *-yugnarqe-* 'probably' modifies just the projected going, expressed by the material to its left. It is followed by a suffix *-ni-* 'claim' and a past tense marker *-llru-*. In (3)b, the same suffix follows both *-ni-* and *-llru-* and modifies the full derived stem: 'claimed he would go'. In both, the past tense *-llru-* appears to the left or outside of the future tense *-ciq-*, conveying a past statement about a projected event.

(3) Yup'ik scope alternations: Jacobson 1995: 324

a. *ayagciqsugnarqnilrruq*
ayag-ciq-yugnarqe-ni-llru-u-q
go-FUTURE-probably-claim-PAST-INDICATIVE:INTRANSITIVE-3:SG
'He said he would probably go.'

b. *ayagciqnilrruyugnarquq*
ayag-ciq-ni-llru-yugnarqe-u-q
go-FUTURE-claim-PAST-probably-INDICATIVE:INTRANSITIVE-3:SG
'He probably said he would go.'

Yet even within a system like Yup'ik, morpheme order is not fully free. Of course some orders occur more often simply because the scope reflected in one order corresponds to what speakers wish to say more often than the reverse. Certain recurring orders in Yup'ik are reflected in the development of what could be called compound suffixes: multi-suffix chunks that they are processed as a single unit. One such unit is the negative desiderative seen in (1): *-yuumiite-*, from the combination *-yug-umi-ite-* DESIDERATIVE-STATIVE-NEGATIVE. There is no grammatical or semantic reason why a different sequence of suffixes could be used to mean 'not want', such as DESIDERATIVE-NEGATIVE: speakers simply use the ready-made unit *-yuumiite-* rather than building up a negative desiderative each time from possible components. Suffix clusters often show greater

phonological fusion than other sequences of suffixes, and they are not necessarily equivalent in meaning to the sum of the meanings of their parts. Such semantic independence is well illustrated in the cluster *-ngssaar-* 'secretively, unnoticeably, without letting oneself be seen'.

- (4) Yup'ik suffix complex: Elizabeth Ali, speaker
atungssaaralriit
atur-ngssak-arar-lri-it
 sing-small-a:little:at:a:time-PARTICIPIAL-3:PL
 'They're singing in secret.'

Jacobson (1984: 517) derives this suffix complex from *-ngssak-* 'small, non-vital ...ing' plus *-arar-* 'to ... a little at a time'. The link between 'small' and 'secretive' is not difficult to imagine. One often makes small movements in order to avoid attracting notice. The base *atu-ngssaarak-* can be used, for example, for someone humming under her breath. In the modern language, the movements no longer need be small: someone could be singing robustly out of the earshot of those from whom she wanted to conceal her actions. The verb in (4) was used to refer to the fact that traditional songs were kept alive through most of this century because ceremonies, forbidden by missionaries, were held in secret.

The routinization of frequently occurring morphological sequences constrains morpheme order to some extent. Yup'ik morpheme order is further constrained in another way. There is a clear distinction between the derivational and inflectional suffix zones. Every noun and verb must have one and only one inflectional ending. For nouns, the ending encodes number and case and, if the referent is possessed, the number and person of the possessor as well. For verbs, the inflectional ending consists of two parts, a mood marker (indicative, interrogative, optative, etc.) and a pronominal suffix specifying the core arguments of the clause. The mood and pronominal suffixes form a tight-knit unit: the choice of mood determines the choice of pronominal paradigm, and the mood and pronominal suffixes are fused.

Templatic systems, by contrast, show a fixed order among morphemes. The order does not necessarily reflect scope considerations. An example of templatic ordering can be seen in languages of the Iroquoian family. As in many polysynthetic languages, morphological complexity is concentrated in the verb. Verb structure is schematized in Figure 2.

PREPRONOMINAL PREFIXES	PRONOMINAL PREFIXES	REFLEXIVE PREFIX	NOUN STEM	VERB STEM	DERIVATIONAL SUFFIXES	ASPECTUAL SUFFIXES	FINAL SUFFIXES
---------------------------	------------------------	---------------------	--------------	--------------	--------------------------	-----------------------	-------------------

FIGURE 2: IROQUOIAN MORPHOLOGICAL STRUCTURE WITHIN THE VERB

None of these morphemes ever appears outside of its regular position. It would be difficult to argue that the order consistently reflects semantic or grammatical scope. Two of the prepronominal prefixes, the cislocative and the translocative, appear to represent perfectly opposite distinctions. The cislocative typically indicates action directed toward a point of reference ('come', 'bring'), and the translocative indicates motion away ('go', 'take'). Yet the two prefixes occur in different positions in the template. The cislocative is an inner prepronominal prefix, usually appearing immediately before the pronominal prefixes; the translocative is an outer prepronominal prefix, occupying the first or second position in the word.

SOUTHERN IROQUOIAN						
NEGATIVE	TRANSLOCATIVE	PARTITIVE	DISTRIBUTIVE	CISLOCATIVE	REPETITIVE	NEGATIVE
RELATIVE				FUTURE		

NORTHERN IROQUOIAN					
CONTRASTIVE	TRANSLOCATIVE	FACTUAL	DUALIC	FUTURE	CISLOCATIVE
PARTITIVE				OPTATIVE	
NEGATIVE					

FIGURE 3: PREPRONOMINAL PREFIXES

The difference in the positions of the two directional prefixes reflects their different histories: the cislocative prefix developed some time before the translocative prefix.²

Any hope of describing Iroquoian affix order in terms of either synchronic derivation or scope relations is further undermined by the existence of dependencies among non-adjacent morphemes. Within the Northern Iroquoian languages, for example, a large number of verb stems require the presence of a prefix *te-* termed the dualic. The semantic contribution of the dualic is elusive; it sometimes implies two-ness of some kind, sometimes a change of state or position. (The Cherokee cognate of the Northern dualic prefix has the same shape *te-*, but it serves as a distributive, spreading events over various locations or absolutive participants.) In any case it is often impossible to predict the appearance of the dualic in the Northern languages. It simply always cooccurs with certain verb stems, a fact that must be learned with each stem. It occurs in the Mohawk verb 'stand up', for example, but not in the verb 'sit down', though both could be argued to involve a change of position.

(5) Mohawk: unpredictable use of the dualic

- a. *téstaʔn*
te-s-t-aʔn
 DUALIC-2:SG:AGENT-stand-INCHOATIVE
 'Stand up!'

- b. *sátyʔ*
s-at-yʔ
 2:SG:AGENT-REFLEXIVE-set
 'Sit down!'

The dualic is never adjacent to the verb root; it is always separated from it by at least the pronominal prefix and often many others. We thus have a discontinuous dependency.

(6) Mohawk: discontinuous dependency

- taʔsahsaterʔnó:tʔ*
t-ʔu-sa-hs-ate-rʔn-ot-ʔ-'
 DUALIC-OPTATIVE-REPETITIVE-2:SG:AGENT-REFLEXIVE-song-stand-CAUSATIVE-PERFECTIVE

'You should sing again'

Another characteristic of many templatic systems, noted by Rice (1991), is that different areas of the morphology may show different kinds of phonological boundaries. In Athabaskan languages, for example, the inner or 'conjunct' prefixes are more tightly fused phonologically than the outer or 'disjunct' prefixes. The Iroquoian languages show similar differences between inner and outer prefixes. Such differences are easily explained as a function of their longer history as affixes, subject to more internal sandhi processes.

The ordering properties of layered and templatic structures thus differ in significant ways, with layered structures showing more variability, more often reflecting scope relations among morphemes. In both layered and templatic systems, however, morpheme order is substantially more rigid than word order in sentences.

2. Affix order as the reflection of the historical sequence of grammaticization

Comparative evidence within the Iroquoian family largely bears out our expectation that the synchronic order of morphemes in a language tends to reflect their historical order of grammaticalization. The family consists of two main branches, Southern Iroquoian, represented uniquely by modern Cherokee (spoken in North Carolina and Oklahoma), and Northern Iroquoian, which underwent successive splits over the course of its history. The first group to split off from the Northern Iroquoian branch became the Tuscarora, who lived until the early 18th century in North Carolina when they migrated to western New York and then into southern Ontario. The next group to separate became the Huron, encountered in the early 17th century in Ontario. Warfare at mid-century forced some of the Huron to move to Quebec and others to join with neighbors, ultimately migrating west toward Detroit and south into Oklahoma, where they became known as the Wyandot. The remainder of the Northern Iroquoians, the Iroquois proper, occupied present New York State, with the Seneca and Cayuga in the west, the Onondaga in the center, and the Oneida and Mohawk in the east. A simplified schema of this series of splits can be seen in Figure 3. Other groups are known to have been Iroquoian as well, including the Nottoway (close relatives of the Tuscarora), the Susquehannock (Iroquois proper), and the Petun, Erie, Neutral, and Wenro, living between the Huron and the Seneca. All of these groups are now gone, and documentation of their languages is sparse.

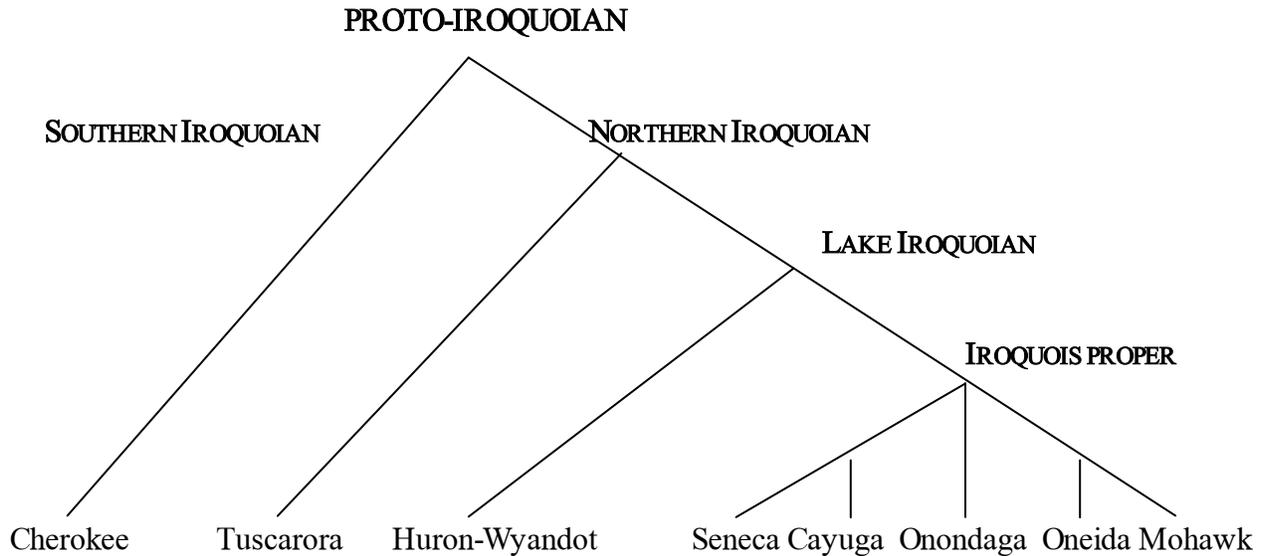


FIGURE 4: THE IROQUOIAN LANGUAGE FAMILY

A consideration of internal relationships within the family is important for establishing the relative chronology of development of the morphology. If a structure is found in Cherokee and at least one of the Northern Iroquoian languages, we can attribute it to the common parent, Proto-Iroquoian. If it is found in Tuscarora and any of the the other Northern languages, we can reconstruct it for Proto-Northern-Iroquoian. The verbal morphologies of the modern Iroquoian languages show great similarity. All share the basic morphological structure schematized in Figure 2, repeated here.

PREPRONOMINAL PREFIXES	PRONOMINAL PREFIXES	REFLEXIVE PREFIX	NOUN STEM	VERB STEM	DERIVATIONAL SUFFIXES	ASPECTUAL SUFFIXES	FINAL SUFFIXES
---------------------------	------------------------	---------------------	--------------	--------------	--------------------------	-----------------------	-------------------

FIGURE 2: IROQUOIAN MORPHOLOGICAL STRUCTURE WITHIN THE VERB

Examples of the inner morphology shared by all languages in the family can be seen in the verbs in (7). All contain a pronominal prefix, reflexive prefix, incorporated noun root, verb root, and aspect suffix. The Tuscarora material comes primarily from speaker Elton Greene, of Tuscarora, New York. The Mohawk material is from speakers at Kahnawà:ke, Kanehsatà:ke, and Ahkwesáhsne Quebec, with special help from Kaia'titáhkhe' Jacobs of Kahnawà:ke and Kanerahthenhá:wi Nicholas of Kanehsatà:ke.

- (7) Core verbal morphology
- a. Cherokee: Cook 1979:134
kaʔlskuhwska
k-ali-hsk-uw-sk-a

1:SG:AGENT-REFLEXIVE-head-shake-IMPERFECTIVE:ASPECT-INDICATIVE
 'I am nodding'

b. Tuscarora: Elton Greene, speaker

kaʔnətaʔrúhar

k-at-taʔr-uhar-h

1:SG:AGENT-REFLEXIVE-head-wash-IMPERFECTIVE:ASPECT

'I'm washing my hair'

c. Mohawk: Kaia'titáhkhe' Jacobs, speaker

katkúhsóhares

k-at-kúhs-ohare-s

1:SG:AGENT-REFLEXIVE-face-wash-IMPERFECTIVE:ASPECT

'I'm washing my face.'

For the most part, the prenominal prefixes, derivational suffixes, and aspectual suffixes are also cognate across the family. The situation is different at the periphery of words, however. Each branch shows outer affixes, in word-initial and word-final position, not shared by the other branch. Cherokee contains an initial conditional prefix that does not appear in the morphology of the Northern languages. The Northern languages contain an initial contrastive prefix that has no counterpart in the morphology of Cherokee. The Lake languages contain a coincident prefix that appears neither in Tuscarora nor Cherokee. In word-final position, following the aspectual suffixes, Cherokee shows a set of modal suffixes lacking counterparts in the Northern languages. The Northern languages contain word-final past tense suffixes without counterparts in Cherokee. The comparative evidence thus confirms the fact that the inner morphology is old, dating back to Proto-Iroquoian, while some outer affixes appear to be recent additions. The synchronic order of affixes does then reflect the historical sequence in which the grammatical categories they represent evolved. Certain factors may intervene to alter this order, however.

3. The externalization of inflection in a layered system: Yup'ik mood

It is well known that derivational affixes generally occur inside of inflectional affixes, that is, closer to the root, yielding maximal structures like that in Figure 5.

INFLECTIONAL PREFIXES	DERIVATIONAL PREFIXES	ROOT	DERIVATIONAL SUFFIXES	INFLECTIONAL SUFFIXES
--------------------------	--------------------------	------	--------------------------	--------------------------

FIGURE 5: INFLECTION OUTSIDE OF DERIVATION

Yet we know that all derivational affixes in a language are not necessarily older than all inflectional affixes. Haspelmath (1993) brings to our attention a set of diachronic shifts in morpheme order whose result was to restore the external position of inflection after grammaticalization had added new derivational affixes to the outside of words, trapping inflectional affixes inside. Speakers restored the preferred structure in two stages. First the

inflection was doubled, with a copy of the inflectional suffix repeated outside of the new derivational suffix. Next the original internal inflection faded, perhaps by analogy to other inflected words that contained no internal inflectional affixes. Only the external copy of the inflectional suffix remained. Haspelmath termed this process the 'externalization of inflection'. Here we will examine another kind of externalization of inflection.

A disturbance in the peripheral position of inflection can result from another diachronic process as well. Existing derivational affixes may evolve into inflectional markers, at first in their original internal positions. At a certain point, they may be reanalyzed as part of an inflectional paradigm and take their place among the other members, at the edge of the word. The evolution of their function (a kind of grammaticalization) and subsequent formal reanalysis can thus stimulate a shift in position. Such a situation can be seen in Yup'ik. It will be recalled that Yup'ik, like other Eskimoan languages, exhibits the morphological structure in Figure 1, repeated here.



FIGURE 1: YUP'IK MORPHOLOGICAL ORDER

The same structure is reconstructed for Proto-Eskimoan by Fortescue, Jacobson, and Kaplan (1994). Both verbs and nouns show this structure, but the two are morphologically distinct. The inflectional suffix complex in nouns specifies the referent and its possessor (if present), as well as case. (Absolutive case is formally unmarked.) The inflectional suffix complex in verbs specifies mood and the core arguments of the clause. The pronominal suffixes on unpossessed nouns resemble those on third person intransitive verbs. The pronominal suffixes on possessed nouns resemble those on transitive verbs. All nouns and verbs contain one and only one inflectional suffix complex.

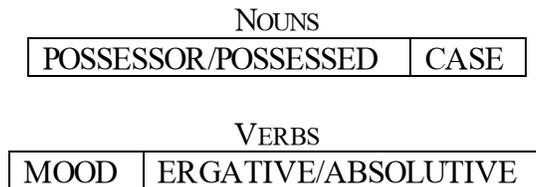


FIGURE 6: INFLECTIONAL SUFFIX COMPLEXES

On the basis of comparative evidence, Fortescue et al. reconstruct four moods for Proto-Eskimoan: indicative, subordinative, interrogative, and optative/imperative. All four persist in modern Yup'ik. A number of additional moods appear in Yup'ik that are not reconstructed for the parent. Many of the new inflectional mood markers are transparently descended from derivational suffixes that are reconstructed for Proto-Eskimoan. One new mood suffix is the past contemporative *-l̄ler-*, usually translated 'when (in the past)'. Examples of its use can be seen in (8).

- (8) Yup'ik past contemporative mood *-l̄ler-*: Elizabeth Ali, speaker
- a. *Ak'a ayagyuarul̄lemni*
ak'a ayagyuaq-u-l̄ler-mni
 past teenager-be-PAST:CONTEMPORATIVE-1:SG
 'Long ago when I was young ...'

- b. *ilaka tauna kassuuteqatalrani*
ila-ka tauna kassuute-qatar-ller-ani
 relative-1:SG/SG that marry-FUTURE-PAST:CONTEMPORATIVE-3:SG
 'when one of my relatives was going to get married ...'

The past contemporative is transparently descended from a nominalizer that persists in modern Yup'ik with the same form *-ller-* 'former (noun) or 'the one that ...-ed or was ...-ed.

- (9) Yup'ik derivational suffix *-ller-* 'the one who (was) ...ed': Elizabeth Ali, speaker
- a. *ekualleq*
ekua-ller
 burn-PAST:NOMINALIZER
 'the one that burned'
- b. *pagaaggun anellret*
pagaa-ggun ane-ller-t
 up:above-VIALIS go.out-PAST:NOMINALIZER-ABSOLUTIVE:PLURAL
 'those who had left through the upper door'

The ancestor of the nominalizer is reconstructed by Fortescue et al. with the same shape: **-lɔɓ*. (Yup'ik orthographic *ll* is a voiceless fricative [ɬ], *e* is a schwa [ə], and *r* is a voiced uvular fricative [ʁ]. Velar and uvular fricatives regularly alternate with stops in final position, like the *r* and *q* here.)

- (10) Proto-Eskimo derivational source: Fortescue et al. 1994: 408-9

Proto Eskimoan	*-lɔɓ	Nominalizer (participial or action)'
Central Alaskan Yup'ik	-lɔq	'former, one that (has) ..., act or state of ..' PAST CONTEMPORATIVE
Alaskan Alutiq Yupik	-lɔq	'former, one that has -ed, or was -ed'
Naukanski Yupik	-lɔq	'action of ...-ing'
Central Siberian Yupik	-lɔq	'one that (has) ...-ed, or has been ...-ed, act of ... -ing
Sirenikski	-lɔx	'action of ...-ing'
Seward Peninsula Inuit	-liq	
North Alaskan Inuit Malimiut	-liq	'action, result of ...-ing'

Traces of the diachronic source of the past contemporative mood are still visible in the shape of the pronominal suffixes that appear with intransitive verbs in this mood. An example of a nominal inflectional suffix complex can be seen in (11). The pronominal suffix is transitive, specifying the possessor and possessed. The case is locative.

- (11) Yup'ik inflection of nouns: Elizabeth Ali, speaker
angyaatni

angyar-at-ni
 boat-3PL/3:SG-LOCATIVE
 'at/in their boat'

The same nominal endings, complete with locative case suffix, appear with intransitive past contemporative verbs.

- (12) Yup'ik mood suffix with intransitive pronominal suffix: Elizabeth Ali, speaker
- | | |
|----------------------------|-------------------------------|
| <i>tangvagkai</i> | <i>ayallratni.</i> |
| <i>tangvag-ke-ai</i> | <i>ayag-ller-atni</i> |
| watch-PARTICIPIAL-3:SG/3PL | leave-PAST:CONTEMPORATIVE-3PL |
- 'He watched them as they were leaving (at their leaving).'

It is clear, however, that contemporatives like *ayallratni* 'as they were leaving' are no longer nominals. They have crossed the line and become verbs. In nominal possessive constructions like 'the man's boat', a noun identifying the possessor ('the man') appears in the ergative case. With past contemporatives like 'as the man left', a noun identifying the leaver ('the man') appears in the absolutive case, consistent with the intransitive status of 'leave'. The man is no longer classified grammatically as a possessor.

- (13) Yup'ik past contemporative with absolutive: Elizabeth Ali, speaker
- a.
- | | |
|-----------------|-------------------------|
| <i>angutem</i> | <i>angyaani</i> |
| <i>angute-m</i> | <i>angyar-a-ni</i> |
| man-ERGATIVE | boat-3:SG/3:SG-LOCATIVE |
- 'in the man's (ERGATIVE) boat'
- b.
- | | |
|----------------|-------------------------------|
| <i>angun</i> | <i>ayallrani</i> |
| <i>angun</i> | <i>ayag-ller-ani</i> |
| man:ABSOLUTIVE | leave-PAST:CONTEMPORATIVE-3SG |
- 'as the man (ABSOLUTIVE) was leaving'

In transitive verbs, the traces of the historical nominal source of the past contemporative are disappearing. The past contemporative mood suffix is now usually followed by the verbal transitive pronominal suffixes that appear with other connective moods.

- (14) Yup'ik transitive past contemporative
- | |
|-------------------------------------|
| <i>tangallraki</i> |
| <i>tangag-ller-aki</i> |
| watch-PAST:CONTEMPORATIVE-3:SG/3:PL |
- 'when he watched them'

These endings differ from the locative possessive counterparts that would appear with nouns: *angya-atni* 'in his boats'.

Other modern Yup'ik mood suffixes can easily be seen to be developing from derivational suffixes as well, derivational suffixes that can be traced back to Proto-Eskimoan and in some cases to Proto-Eskimo-Aleut. The simultaneous contemporative mood marker *-(ng)inaner-* 'while' can be

linked to the derivational suffix *-nginar-* 'to just (verb)' plus the nominalizer *-neq-* 'activity of ...ing'. The consequential mood *-(ng)a-* 'because', has the same form as a derivational suffix *-(ng)a-* translated 'to be in the state of having ...-ed', or 'having been ...-ed', essentially portraying a result. The conditional mood *-ku-* 'when, if' resembles a derivational suffix *-ku-* that derives adverbs pertaining to the future: *wani* 'now', *wani-ku* 'soon'; *unuk* 'night, last night', *unu-ku* 'tonight'. The participial mood suffix *-lria* has the same form as a derivational nominalizer *-lria*. Comparative evidence indicates that the new moods were not all added at the same time, but have been developing during different periods in the history of the family. In fact alternations between nominal and verbal endings on them in the modern language show that some are still in the process of evolving. Yup'ik speakers accept both *tangallr-atni* (nominal ending) and *tangallr-aki* (verbal ending) for 'when he watched them'. Jacobsen 1982 lays out the range of nominalizing constructions in modern Yup'ik along a continuum, from those which are still primarily nominal to those which are primarily verbal.

The evolution of the derivational nominalizers into inflectional mood suffixes has resulted in a shift in morpheme order, consistent with the preference for derivation close to the root and inflection at the periphery of the word. In (15) the derivational nominalizer has a somewhat internal position, followed by a derivational verbalizer *-u-* 'be', then a suffix *-yaq-* 'indeed', then the inflectional suffix complex consisting of the intransitive indicative mood *-u-* and the pronominal suffix *-q*. In (16) the inflectional mood suffix appears immediately before the pronominal suffix *-ani*.

- (15) Yup'ik derivational nominalizer *-lter-*: Elizabeth Ali, speaker
ekualrunritellruyaquq
ekua-llru-nrite-lter-u-yaq-u-q
 burn-PAST-NEGATIVE-PAST:NOMINALIZER-be-indeed-INTRANSITIVE:INDICATIVE-3:SG
 'Indeed it is not the object that burned!'
- (16) Yup'ik inflectional mood *-lter-*: Elizabeth Ali, speaker
qumacunguallrullerani
qumar-cuk-u-aq-llru-lter-ani
 worm-ugly:old-be-indeed-PAST-PAST:CONTEMPORATIVE-3:SG
 'As he was indeed a low-life worm, ...'

It appears that the marker *-lter-* has moved some distance, over several suffixes (here *-llru-* PAST, *-u-* 'be', and *-yaq-* 'indeed'), before landing in the inflectional mood slot. But Yup'ik shows a layered structure rather than a templatic one. Derivational suffixes do not occupy fixed positions, so there are no special derivational slots for the nominalizer to hop over. A somewhat different kind of mechanism led to the apparent change in order.

Nominalizers may occur deeply embedded within the derivational morphology, as in (15), but they appear most often at the end of the derivational string, immediately before the case and pronominal endings. Now the pronominal suffix complexes that indicate possession are similar in form to those that specify the core arguments of indicative verbs. Nouns contain no mood markers: the pronominal suffixes directly follow the noun stem. In many deverbal forms, it would be easy to reanalyze a nominalizer immediately preceding the pronominal complex as a mood marker. The important initial shift was not one of position, but rather from derivational to inflectional status. Only as later derivations were constructed would the shift in status lead to a

visible shift in position.

4. The externalization of inflection in a templatic system: Cherokee infinitives

The evolution of derivation into inflection occurs in templatic structures as well, where slots are well defined. In both the Southern and Northern branches of the Iroquoian family, every indicative verb is inflected for aspect. Aspect is indicated by suffixes that occur word-finally or that are followed by just one other suffix. The aspectual categories in the two branches are similar but not identical. Cook (1979) analyzes North Carolina Cherokee as containing five aspects: two imperfectives (often the same in form), a perfective, a stative, and a category he labels an infinitive. The Northern languages show imperfectives, perfectives, and statives, but no infinitive. (Stative suffixes are also used to mark perfects, essentially resultant states such as 'he has arrived' or 'I have sat down = I am seated'.) All of the languages show a variety of forms representing each category, but certain similarities can be identified across the Southern and Northern branches: imperfectives in both contain *-s*, for example, and the Cherokee stative *-ʌ* corresponds in a regular way to the most common Northern stative **-ɔ*. In both branches of the family, imperfectives and perfectives generally appear with agentive pronominal prefixes, while statives indicating resultant states generally appear with patient pronominal prefixes.

Cherokee thus shows an additional category within the aspectual paradigm not found in the Northern languages: an infinitive. It is used in dependent clauses ('for him to give it to her') and (with a different modal suffix) for potential events ('he has to give it to her').

- (17) Cherokee infinitive: Cook 1979: 96
u.nʌ:-ʔt-i.yi a: kwatu.liha 'I want him to give it to her' (*a.kwatu.liha* 'I want it')
u.nʌ:-ʔt-i 'he has to give it to her'

Infinitives show an intriguing set of allomorphs, not relatable by regular phonological rule: *-ihst*, *-hst*, *-ʔst*, *-ihst*, *-oʔt*, *-ʔt*, *-ʌht*, *-oht*, and *-ht*.

- (18) Cherokee infinitive allomorphs: Cook 1979:100-10
a:kikʔ-ihst-i 'I have to eat it'
a:kwahné:k-hst-i 'I have to build it'
i:ya:kíwe-ʔst-i 'I have to say it'
a:ki:tal:k-oʔt-i 'I have to plow'
a:kiko:lí:ye-ʔt-i 'I have to read'
a:kikohwth-ʌht-i 'I have to see it'
ti:kwatshi:ló:st-oht-i 'I have to draw'
a:khinóhé-ht-i 'I have to tell it'

The diachronic source of the new Cherokee infinitive markers can still be recovered. Among the derivational suffixes in the Iroquoian languages are a set of causative-instrumentals. They show a striking array of shapes, appearing in Cherokee as *-ihst*, *-hst*, *-ʔst*, *-ʌht*, *-oʔt*, *-ʔt*, *-ʌht*, *-oht*, and *-ht*, and in all of the Northern languages as *-hst*, *-ʔst*, *-ʔt*, *-ht*, and *-hkw*. They contribute either causative or instrumental applicative meanings, depending to some extent on the animacy of the introduced participant.

(19) Causative-instrumentals

- a. Cherokee: Cook 1979: 138-9, King 1975: 88

kohwe:liʔskoʔi 'he writes'
kohwe:l-éʔt-ihsko:ʔi 'he writes with it', 'he makes him write'

koho:hska 'it (round) is falling'
koh-ht-iha 'he is dropping it (round)'

ats_Δ:ʔka 'it is spilling'
ats_Δ:ʔ-ihst-iha 'he is pouring it out'

- b. Tuscarora: Elton Greene, speaker

wahəʔθəʔ 'it fell'
wahráʔθə-ht 'he made it fall, he dropped it'

yusná:thə: 'it is dry'
əksná:th-aʔt 'I will make it dry, I will dry it'

yəʔshù:rih 'one eats'
yəʔshury-áʔt-haʔ 'one eats with it, kitchen'

- c. Mohawk

yohstáth_Δ 'it is dry'
waʔkxstátha-ʔt-eʔ 'I dried it'

yoθs_Δ:ʔə 'it has fallen'
waʔká:s_Δ-ht-eʔ 'I dropped it'

yehwistà:ʔeks 'one strikes metal'
yehwistaʔéksthaʔ 'one strikes metal with it = 'bell'

Because they occur in both branches of the family, we can reconstruct the causative-instrumental suffixes **-ihst*, **-ht*, **ʔt* for Proto-Iroquoian. We can do even more. Languages from both branches of the family retain reflexes of a full verb root that was an apparent lexical source for some of the forms: **-ihst*- 'use'.

(20) Lexical source: verb root **-ihst*- 'use'

- a. Cherokee: King 1975: 89

nikah_hlstiha
ni-k-al-hst-ih-a

PARTITIVE-1:SG:AGENT-REFLEXIVE-use-IMPERFECTIVE-INDICATIVE
 'it is happening'

b. Tuscarora: Elton Greene, speaker

kíhstha?

k-ihst-ha?

1:SG:AGENT-use-IMPERFECTIVE

'I use it.'

c. Mohawk

kátstha?

k-át-st-ha?

1:SG:AGENT-REFLEXIVE-use-IMPERFECTIVE

'I use it.'

The probable antecedent of the suffix *-(A)ht-* is retained in another Cherokee verb root: *-Aht-* 'use'.

(21) Lexical source: verb root *-Aht-* 'use'

Cherokee: King 1975: 89

k_Ahtihsk_A:ki

ka-Aht-ihsk-A:ki

3:SG:AGENT-use-IMPERFECTIVE-ASSERTIVE

'he was using it'

The odd array of allomorphs exhibited by the Cherokee causative/instrumentals (and reconstructible for Proto-Iroquoian) is exactly the same as the odd array exhibited by the new Cherokee infinitive. The array is too unusual for the resemblance to be due to chance. It strongly suggests that the older derivational causative/instrumental markers evolved into the new inflectional infinitive markers. It appears unlikely that the original verb roots that served as the sources of the causative/instrumentals could have evolved directly and independently into the infinitive markers, given the perfect correspondence between the arrays of instrumental and infinitive forms. Furthermore, individual stems within Cherokee exhibit the same allomorphs of the instrumental and infinitive suffixes, though the allomorphy is not phonologically conditioned. The verb root *-hne:?* 'speak', for example, appears with both the instrumental *-ihst-* and the infinitive *-ihst-*.

(22) Same allomorphy with instrumentals and infinitives: Cook 1979: 134, 123

tsi'ne:?'-ihst-ih_A

'I am talking about it'

(INSTRUMENTAL)

ti:khiné:?'-ihst-i

'I have to speak'

(INFINITIVE)

It is clear that by now, the instrumental and infinitive are distinct suffixes. They may cooccur within a verb.

(23) Cherokee instrumental with infinitive: Cook 1979: 138

a:kwohwe:l-ó?t-oh_t-i

'I have to write with it'

The development of the infinitive category in Cherokee may have been stimulated by language contact. The Southeast constitutes a recognized linguistic area, including not only Cherokee of the Iroquoian family, but also languages of the Muskogean and Caddoan families. Both Creek, a Muskogean language, and Caddo, a Caddoan language, contain infinitives (Jack Martin p.c. and Wallace Chafe p.c.) Whatever the initial stimulus, Cherokee speakers exploited language-internal resources for the new infinitive markers. In the Iroquoian languages, morphological verbs are commonly used periphrastically as syntactic nominals, providing descriptive names of objects, such as the Mohawk *tehahũhtané:kʌ* 'his ears are side by side' = 'rabbit'. No overt category shifter is necessary: morphological verbs simply function syntactically as nominals, without special marking. The instrumental suffix appears in large numbers of such constructions, because introduced objects have so often been described in terms of their uses.

(23) Mohawk instrumental verb as syntactic nominal

yũtkũhsokewáhtha?

ye-at-kũhs-okew-ht-ha?

INDEFINITE:AGENT-REFLEXIVE-face-wipe-INSTRUMENTAL-IMPERFECTIVE

'one wipes one's face with it' = 'towel'

In all of the Northern languages, the imperfective aspect suffix *-ha?* in particularly common constructions of this type has been replaced with the noun suffix *-a?*. In some of the languages, the forms have been shortened, omitting the instrumental and imperfective. The Mohawk term for 'car', for example, probably first coined for 'wagon', originated as an instrumental verb based on the root *-?sre-* 'drag'. The instrumental suffix is now omitted in Mohawk, though it is retained in some of the other Northern Iroquoian languages. When the noun root for 'car' is incorporated into another verb, however, the instrumental suffix must be present. There is a general grammatical requirement that only formal morphological noun stems may be incorporated. The instrumental suffix can now apparently function on its own as a marker of nominalization.

(24) Mohawk instrumental verb as nominal

a. *ká:sere?*

ka-?sre-e?

NEUTER:AGENT-drag-IMPERFECTIVE

'it drags'

b. **ka?seréhtha?*

ka-?sreh-ht-ha?

NEUTER:AGENT-drag-INSTRUMENTAL-IMPERFECTIVE

'it is used to drag'

>

ká:sere

'car'

(cf. Cayuga *k?atréhtha?* 'car')

c. *ka?serehtí:yo*

ka-?sre-ht-íyo

NEUTER:AGENT-drag-INSTRUMENTAL-be:nice:STATIVE

'it is a nice car' ('what is used to drag is nice')

A number of other modern nominals in the languages show a similar pattern, though no verbal

origin is now recoverable. When incorporated, they include an additional sequence identical in form to one of the instrumental suffixes.

- (25) Mohawk nominalizers under incorporation
- | | | | |
|---------------|--------|---------------------|---------------------|
| <i>rí:kwe</i> | 'man' | <i>ríkhweʔí:yo</i> | 'he is a nice man' |
| <i>áhta</i> | 'shoe' | <i>wahtahkwí:yo</i> | 'it is a nice shoe' |

Why should such forms evolve into infinitives? Infinitives in many languages serve to reify or objectify events and states, a kind of nominalizing function. This nominalizing function may have served as a semantic link between Cherokee instrumentals, frequently used in nominals, and infinitives. Describing Oklahoma Cherokee, Pulte (1975) points to the match in form between certain nominals and infinitives, with only a change in pronominal prefix.

- (26) Cherokee nominalized verbs and infinitives: Pulte 1975: 321
- | | | |
|-----------------------------|---|----------------|
| <i>u-nakwalosti utuliha</i> | 'he wants <u>to hammer</u> ' | |
| <i>ka-nakwalosti</i> | ' <u>something to be hammered, hammer</u> ' | (INSTRUMENTAL) |

Of particular interest here is the fact that the evolution from instrumental to infinitive appears to have been accompanied by a drastic shift in morpheme order. The instrumental is an inner derivational suffix in all of the Iroquoian languages, while the aspect markers are outer inflectional suffixes. The suffix morphology of the two branches of the family is compared in Figure 6.

SOUTHERN IROQUOIAN										
REVERSIVE	CAUS-INSTRUMENTAL	DAT	AND	PURP	ITER	PROG	REP	COMPL	ASPECT	MODE
NORTHERN IROQUOIAN										
REVERSIVE	CAUS-INSTRUMENTAL	INST	DATIVE	ANDATIVE	PURPOSIVE	DISTR	PROG	ASPECT	TENSE	

FIGURE 7: SUFFIXES

(Suffixes are the REVERSIVE 'un(do)', CAUSATIVE-INSTRUMENTAL 'with', 'cause', INST for INSTRUMENTAL 'with', DAT for DATIVE-BENEFACTIVE 'for', AND for ANDATIVE 'go and', PURP for PURPOSIVE 'in order to', ITER for REITERATIVE 'repeatedly', REP for REPETITIVE 'again', DISTR for 'distributive', PROG for PROGRESSIVE, and COMPL for COMPLETIVE 'finish'.)

Both the derivational suffixes and the inflectional aspect markers appear to have been in place in the parent language. The inner derivational suffixes generally appear to be cognate, though precise reconstructions are not possible given the brevity of the forms. The Cherokee reversive is *-ki:-/y-* and the Northern Iroquoian counterparts **-hkwi-/hsy-*. The Cherokee dative-benefactive 'for' has Cherokee forms *-e:-/hsi-* and Northern Iroquoian counterparts **-ʔse-/ʔs-/ati-/ahs-/hse-/ε-*. The andative 'go and' has forms *-hi-/ihl-* in Cherokee and **-h-/hr-/hn-/hsr-* in the Northern languages. The purposive 'in order to' has the form *-e:-* in Cherokee and *-e-* in the Northern languages. (This suffix is probably descended from the root *-e-* 'go' which retains reflexes in all of the modern languages.) The last derivational suffixes are comparable in function between the two branches of the family and show some similarity in shape, but it is difficult to

determine whether or not they are cognate. Cook lists the reiterative as *-hiʔs-*, somewhat reminiscent of the Northern Iroquoian distributives *-ʔs* and *-ʔshq*. The progressive (termed 'ambulative' by Cook for Cherokee) is attached to stative verbs in all languages and shows similar but not identical shapes, *-i:to:-/i:ta* in Cherokee and **-atyeʔ* in the Northern languages, with similar meanings 'go along ...-ing', 'go about ...-ing'.

In their development from instrumentals to infinitives, the suffixes appear at first to have jumped over the dative, the andative, the purposive, the reiterative, the progressive, the repetitive, and the completive, all of which precede the aspect suffixes. The actual mechanism was probably not a long-distance hop, however, but rather a multi-step process of reanalysis, parallel to that observed in Yup'ik. All of the derivational suffixes that follow the instrumental are optional; most often the instrumental is the last suffix in the stem. The marker probably first began to acquire an infinitival sense in its original position within the derivational morphology. As its function was generalized from that of a derivational instrumental suffix through that of a nominalizer to that of an infinitive, it showed increasing semantic affinity to the set of existing aspectual suffixes. At a certain point it was reanalyzed as part of the aspectual paradigm, to which it was usually adjacent. The shift in status from derivational to inflectional did not necessarily entail a shift in position of the marker itself. If anything, it was the boundary between derivation and inflection that shifted in these constructions, from the right to the left of the suffix. It was only when new complex forms were derived, and other derivational suffixes were positioned to the left of the new infinitive, that the reanalysis became visible.

5. Conclusion

The comparative method confirms our expectation that to a significant extent, the order of affixes within words reflects their historical order of attachment. Those affixes closest to the root were generally grammaticalized earlier than those on the periphery of the word. The comparative method also shows us some of the situations that can stimulate a change in this order. An important one is the evolution of derivational affixes into inflection. Derivational markers are usually inner affixes, occurring closer to the root, while inflectional markers are generally outer affixes, occurring at the periphery of words. In Yup'ik, a language with layered morphology, we saw the shift of derivational nominalizers to inflectional mood markers. A similar situation occurred in Cherokee, a language with templatic morphology. Earlier derivational instrumental suffixes, whose ultimate source can be traced to verb roots meaning 'use', evolved into inflectional infinitive markers, and in the process shifted their position outward, across a number of other derivational suffixes, to take their place within the inflectional aspectual paradigm. In the end, the distinction between the layered and templatic structures had little effect on the processes examined here. They did not involve a simple one-stage hop across morpheme slots, but rather a reinterpretation of the boundary between derivation and inflection. Since none of the suffixes that might occur between the derivational markers in question and the final inflectional markers is obligatory, the markers often appeared immediately before the inflectional suffixes, a good position for reanalysis of their status as part of the adjacent inflectional paradigm. It would only be when new derivationally complex forms were created that the implications of the reanalysis for morpheme order would become visible, as derivational suffixes were systematically added to the left of the new inflectional suffixes.

Developments such as these confirm that though morpheme order may be routinized and

rigidified within a language, it is not necessarily fully frozen or opaque. Speakers must still have sufficient access on some level to the general architecture of the morphology and the functions of individual morphemes, perhaps when they are first learning their languages, to restore the external position of inflection when it is threatened.

Notes

¹The following symbols are used in the practical orthography developed at the Alaska Native Language Center and currently in wide use. There are plain stops *p*, *t*, *k*, *q* with their usual IPA values, and an affricate *c* that varies between [ts] and [tʃ]. Voiced fricatives are *v*, *s* (= [z]), *l*, *y*, *g* (= [ɣ]), *ug* (= [ɣʷ]), *r* (= [ʁ]) and *ur* (= [ʁʷ]). Voiceless counterparts are written with doubled consonants: *vv* (= [f]), *ss* (= [s]), *ll* (= [t]), *gg* (= [x]), *w* (= [xʷ]), *rr* (= [x]), and *urr* (= [xʷ]). Fricatives are automatically devoiced adjacent to voiceless segments and word-initially and -finally. There are voiced and voiceless nasals *m*, *n*, and *ng* (= [ŋ]). Vowels are *i*, *a*, *u*, and *e* (= [ə]).

²Internal semantic reconstruction may also provide evidence of the relative sequence of grammaticization. As noted above, all of the Iroquoian languages contain a cislocative prefix **ta-*/*t-* indicating motion directed toward some reference point (often the speaker) and a translocative prefix **w-* indicating motion away. (The translocative has various shapes in the modern Northern languages, including *y-* and *h-*, but all of the languages contain at least relics of the earlier **w-*. Thus the basic command 'Go!' or 'Get away!' in Tuscarora *wáʔθeh* 'go!', Mohawk is *wá:s*.) The cislocative and translocative prefixes seem to be perfect counterparts, just the kind we would expect to occupy the same slot in a morphological template.

(i) Cislocative **ta-*/*t-* and translocative **w-*

a. Cherokee: Cook 1979: 63, 76

<i>a:ʔi</i>	'he is going'	
<i>t-ʔi</i>	'he is <u>coming</u> '	CISLOCATIVE
<i>w-a:ʔi</i>	'he is going <u>away</u> '	TRANSLOCATIVE

b. Tuscarora: Elton Greene, speaker

<i>rú:ʔnəh</i>	'he has thrown it'	
<i>t-hrú:ʔnəh</i>	'he has thrown it <u>here</u> '	CISLOCATIVE
<i>w-e-hrú:ʔnəh</i>	'he has thrown it <u>away</u> '	TRANSLOCATIVE

Yet the cislocative is an inner prefix, while the translocative is an outer prefix. Several prefixes can appear after the translocative but before the cislocative in all of the languages.

SOUTHERN IROQUOIAN

NEGATIVE	TRANSLOCATIVE	PARTITIVE	DISTRIBUTIVE	CISLOCATIVE	REPETITIVE	NEGATIVE
RELATIVE				FUTURE		

NORTHERN IROQUOIAN

CONTRASTIVE	TRANSLOCATIVE	FACTUAL	DUALIC	FUTURE	CISLOCATIVE
PARTITIVE				OPTATIVE	
NEGATIVE					

FIGURE 3: PREPRONOMINAL PREFIXES

A comparison of the precise functions of the cislocative and translocative suggests that the difference in position reflects the fact that they were grammaticized at different moments.

When the cislocative and translocative appear with verbs involving a change of location, as above, they signal direction: 'toward' or 'away'. When they appear with non-directional verbs, they indicate location. The cislocative indicates unspecified location, often made more specific by another word or phrase or by context.

(ii) Cislocative

- a. Cherokee: Cook 1979:63

kato:ʔka 'he's standing'
ti-kato:ʔka 'he's standing there'

- b. Tuscarora: Elton Greene, speaker

ruʔnaʔnihrəh 'he is standing'
t-hruʔnaʔnihrəh 'he is standing there'

When the translocative appears with verbs not involving directional motion, it has a marked sense, specifying distant location.

(iii) Translocatives without directional motion

- a. Cherokee: Cook 1979:63

kato:ʔka 'he's standing'
wi-kato:ʔka 'he's standing over there'

- b. Tuscarora: Elton Greene, speaker

ruʔnaʔnihrəh 'he is standing'
we-hruʔnaʔnihrəh 'he is standing over there'

Cook notes that in Cherokee, with non-motion verbs the translocative can further indicate that the actor or the object acted on is oriented away from the speaker: *wikato:ʔka* 'he's standing over there (facing away from me)' (Cook 1979: 63).

The subtle difference in semantics between the cislocative and the translocative suggests

that they were not originally part of the same paradigmatic set, and not grammaticalized at the same time. It would appear that the cislocative was first grammaticalized with a general locative function, one that it retains in all of the modern languages. It was not until the translocative was added to the verbal morphology sometime later that a contrast with distal location was established.

References

- Baker, Mark. 1985. "The Mirror Principle and Morphosyntactic Explanation." *Linguistic Inquiry* 16: 373-416.
- Bybee, Joan. 1985. *Morphology*. Amsterdam: John Benjamins.
- Chafe, Wallace. 1967. *Seneca Morphology and Dictionary*. Washington D.C.: Smithsonian Institution.
- Chaumonot, Pierre Joseph Marie. 1831. "Grammar of the Huron Language". *Quebec Literary and Historical Society Transactions* 2: 94-198. Reprinted 1920 in Alexander Fraser (ed.), *Fifteenth Report of the Bureau of Archives for the Province of Ontario, 1918-1919*, Toronto: Clarkson James.
- Comrie, Bernard. 1980. "Morphology and Word Order Reconstruction: Problems and Prospects. In Jacek Fisiak (ed.), *Historical Morphology*. The Hague: Mouton, 83-96.
- Cook, William. ms. "The Iroquoian Origins of the Cherokee Language: Part I: The Pronominal Prefixes.
- Cook, William 1979. *A Grammar of North Carolina Cherokee*. Ph.D. dissertation in Linguistics, Yale University.
- Fortescue, Michael, Steven Jacobson, and Lawrence Kaplan 1994. *Comparative Eskimo Dictionary, with Aleut Cognates*. Fairbanks: Alaska Native Language Center, University of Alaska.
- Givón, Talmy. 1971. "Historical Syntax and Synchronic Morphology: An Archaeologist's Field Trip". *Proceedings of the Chicago Linguistics Society* 1971: 394-415.
- Harris, Alice. 1997. Order of Morphemes: Change and Maintenance. Paper delivered at the International Congress of Historical Linguistics, Dsseldorf.
- Haspelmath, Martin. 1993. The Diachronic Externalization of Inflection. *Linguistics* 31: 279-310.
- Jacobson, Steven. 1982. Types of Partial Nominalization in Central Yup'ik Eskimo. *Etudes/Inuit/ Studies* 6.2.
- Jacobson, Steven. 1984. *Yup'ik Eskimo Dictionary*. Fairbanks: Alaska Native Language Center, University of Alaska.
- King, Duane. 1975. *A Grammar and Dictionary of the Cherokee Language*. Ph.D. dissertation, Department of Linguistics, University of Georgia. University Microfilms 76-13,965.
- Lagarde, Pierrette. 1980. *Le verbe huron*. Paris: Editions L'Harmattan.
- Lounsbury, Floyd. 1953. *Oneida Verb Morphology*. New Haven: Yale University Press.
- Meillet, Antoine 1912. L'évolution des formes grammaticales. *Seintia (Rivista di scienza)* 12.26: 6.

- Reprinted 1958 in *Linguistique historique et linguistique générale*, Antoine Meillet. Paris: La Société de Linguistique de Paris - 8. Librairie Honoré Champion. 30-48.
- Michelson, Karin. ms. *Language Patterns in Ontario Oneida, Cayuga and Mohawk*.
- Mithun, Marianne. 1995. "Affixation and Morphological Longevity". In Geert Booij and Jaap van Marle (eds.), *Yearbook of Morphology 1994*. Dordrecht: Kluwer 73-97.
- Pulte, William. 1975. "Outline of Cherokee Grammar". In Durbin Feeling (ed.), *Cherokee-English Dictionary*. Tahlequah, Oklahoma: Cherokee Nation of Oklahoma.
- Rice, Keren .1991. "Predicting the Order of the Disjunct Morphemes in the Athapaskan Languages".
Toronto Working Papers in Linguistics 11.1: 99-121.
- Woodbury, Hanni. 1992. *Concerning the League*. Algonquian and Iroquoian Linguistics Memoir 9.
- Woodbury, Hanni. ms. *Language Patterns in Onondaga*. To be published by the University of Toronto Press.

THE REORDERING OF MORPHEMES

Marianne Mithun
University of California, Santa Barbara

March 1999

e-mail: mithun@linguistics.ucsb.edu