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## FOREWARD

It is with great pleasure that we present the proceedings of the second Workshop on American Indigenous Languages (WAIL '99). In continuing a tradition begun with the student discussion group on North American Indigenous Languages (NAIL), the evolving membership wishes to pay tribute to Marianne Mithun and Wallace Chafe for their consistent encouragement and support. We hope that this second volume of the Working Papers represents another step in the development of WAIL, as a forum where we may all share our discoveries, both descriptive and theoretical, concerning these increasingly endangered languages.

John Banks

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## Preliminary Studies of the Distribution of *Aamma* in West Greenlandic

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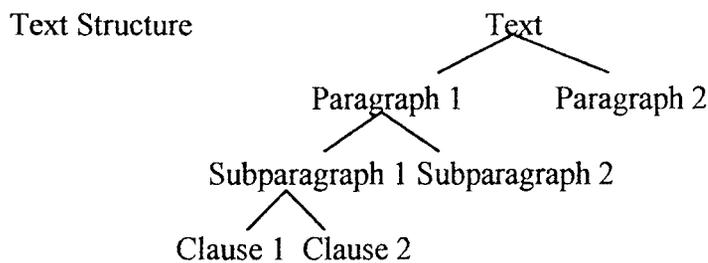
In the literature, there is little information available on the nature, function, and distribution of particles. They are difficult to describe and seem to fall outside the general domain of the sentence. So there is little information available on what role they play in structuring speech (especially in the less-well described languages). In the past decade, there have been a number of studies of particles which have shown that they are important indicators of text structure. For example, the choice of particles will determine how to interpret an argument (Schiffirin, 1987). But studies of particles have focused on their pragmatic rather than structural uses (cf. Mosegaard Hansen, 1998), primarily because text or discourse structure is held to be fundamentally different from syntax. Whereas speakers can form grammatical sentences without context and interpret them, it is assumed that the same is not true of texts. A text is held to be well-formed because of the presentation of its content rather than because of its structure. For the past few years, however, I have been claiming that to have discourse competence is to have structural as well as pragmatic competence, and that discourse can be analyzed with many of the same tools available to the study of syntax. Based on preliminary studies of the distribution of particles in West Greenlandic oral texts, I suggest that particles may have structural functions in the discourse, just as one expects conjunctions such as 'and' to have structural functions in the syntax (which is not to say that 'and' does not have other functions). They just may not be clearly understood as yet.

It is with this in mind that I have undertaken my current studies. In this paper, I will be discussing the role of the discourse particle *aamma*, roughly translatable as 'and', 'also', etc., in structuring West Greenlandic oral texts. There are a number of ways of expressing the meanings associated with *aamma*, including through the use of enclitics. The question will be to understand the contribution *aamma* itself makes to oral texts, and in what way it is distinguished from enclitics with similar functions. I will show that *aamma* has a definable and predictable role as a marker of thematic continuation in a text, and that other meanings associated with the particle may arise out of this function. I will show that this is in keeping with already established patterns of marking thematic continuity or shift in West Greenlandic discourse. I will first introduce the terminology I will be using and the theoretical framework within which I am working. I will then discuss the range of functions that *aamma* appears to have and compare these to the characteristics of the seemingly synonymous enclitics. Finally, I will show how these findings support the idea of a largely structural component to discourse.

With respect to the terminology and theoretical framework, I will be assuming a common understanding of terms which are not always understood in consistent ways; these include the terms *topic*, *theme*, *textual/discourse structure*, *paragraph*, and *discourse particles*. The terms *topic* and *theme* have been applied to studies of both syntax and discourse. In my studies, I have consistently defined them as discourse rather

than syntactic elements. I perceive them as a pair, related to each other as are nouns and verbs in the lexicon, or noun phrases and verb phrases in the syntax. At the level of discourse, topic is the nominal entity with prominence in a continuous stretch of discourse; theme is the verbal or clausal entity with discourse continuity and prominence.

Texts can be analyzed as having hierarchical structure in the same way that sentences can, and this is what I mean by text or discourse structure. Briefly, a text has constituent structure and can be analyzed as being made up of one or more paragraphs, where each paragraph is in turn made up of one or more subparagraphs or clauses. A paragraph is identified through its unity of action, setting, time, topic, etc., the sum total of which is called “thematic continuity” (Givón, 1990). Thus, within a paragraph, there is thematic continuity; between paragraphs, there is some degree of thematic shift.



The constituents at each level are frequently linked by items such as *and*; these are known as ‘discourse particles’. Definitions of discourse particles have varied, but the consensus seems to be that they are primarily connectors of some kind. I follow Mosegaard Hansen in assuming that they connect all kinds of discourse utterances, from words to paragraphs, indeed anything that can be considered a constituent of the discourse; they do not contribute to the actual message of the clause within which they are found, but rather, they are signals to the hearer as to how to understand the relationship of various parts of the discourse to each other.

In a recent paper, I looked at three such particles, and I found that they indicated, for example, the start of a new paragraph or the end of a preceding one (i.e. topic/thematic shift), among other things. The most important particle that I left unmentioned in my previous study is *aamma*, one of the most frequently used particles in oral texts in West Greenlandic. It has been variously translated as ‘and’, ‘also’, ‘again’, ‘once more’, and ‘further’, and it has been described as marking emphasis (Fortescue, 1984:13, 113) or degree (Bergsland, 1955:158). This appears to be the extent of description and understanding of *aamma*. There are, however, many other ways of indicating the meanings associated with this particle in West Greenlandic. For example, simple conjunction can be indicated by the use of the contemporative verb mood in clause combination (I do not discuss this further here) or by the use of the enclitic *-lu*:

1. Umiaasat umiatsiaallu

umiiasaq-t

umiatsiaaq-t-lu

flat-bottomed.rowboat-pl.abs rowboat-pl.abs-and at.that.time-via

flat-bottomed rowboats **and** rowboats

In some cases, both the enclitic and the free particle are found together in the same clause with apparently the same function:

2. meeqqat **aamma** anaanakkut ataatakkullu meeqqat  
 meeraq-t aamma anaana-kkut ataata-kkut-lu meeraq-t  
 child-pl.abs and mother-family.abs father-family.abs-and child-pl.abs  
 the children **and** [my] mother's family **and** [my] father's family the children

Emphasis is often indicated by the use of the enclitics *-li* or *-mi*, or, on verbs, by the use of various derivational suffixes such as *-qi-*:

3. meeraaninniilli  
 meeraaneq-m-niit-li  
 childhood-1sg.pos/sg.posm-from-intens  
 ‘right from my childhood’
4. soorunalumi  
 sooruna-lu-mi  
 of.course-and-what.about  
 ‘and of course’
5. eqqaamaqaara  
 eqqaama-qi-vara  
 remember-intens-1sg.S/3sg.O.I  
 ‘I remember’ (‘I really remember’)

Further, *aamma* appears to have various other meanings as well. For example, in some cases it seems to translate better as ‘but’ than ‘and’:

6. aasaanerusukkullu umiaq ator- umiaasaq ator-neqartarput;  
 aasaq-u-neru-soq-kkut-lu umiaq-0 umiaasaq-0 ator-neqaq-saq-vut  
 summer-cop-compar-nom.P-via-and umiaq-abs rowboat-abs use-pas-habit-3pl.I  
 and umiaks- rowboats were used more in the summertime

aalisaatigalugit.  
 aalisaq-utigi-lugit  
 fish-in.order.to-3pl.O.CT  
 in order to fish [i.e. in order to use them to fish].

Qajatut **aamma**, sukkatiginnginnamik,  
 qajaq-tut aamma sukka-tigi-nngit-namik  
 kayak-pl.eq and fast-as.much.as-neg-neg.3c.pl.CA  
**and** as kayaks, they were not as fast

(n.b. kayaks were mentioned just before in the text)

Several questions then present themselves: how does *aamma* differ from other indications of emphasis or conjunction, what added information does *aamma* bring to the language, and why does it appear to serve such different functions? In fact, particles are typically described as having multiple functions, which sometimes even overlap, and this tends to suggest discourse rather than syntactic level explanations (cf. Mosegaard Hansen, 1998). The questions can be better understood in terms which apply to discourse: instead of speaking of conjunction between clauses, for example, it would be more productive to find a discourse-based explanation. To fully address these questions, it is necessary to understand how both the enclitics and the independent particle are used, as well as the context in which they are used.

The enclitic *-lu* is the primary coordinating conjunction in West Greenlandic and is similar to ‘and’ in this usage in English. It is consistently found in constructions in which two structurally equivalent phrases are conjoined. It can conjoin parallel structures at all levels of the structural hierarchy; that is, it can conjoin words, phrases, and paragraphs:

Conjoining words:

see examples 1 or 8

Conjoining clauses:

7. Uanga isikka isigilluaqqaalermata  
 Uanga isi-kka isigi-lluq-qqaq-ler-mata  
 1sg eye-1sg.pos.abs/pl.posm see-well-first-begin-3nc.pl.CA  
 When my eyes first began to see well

siutikkalu tusaalluaqqaalerlutik  
 siuti-kka-lu tusaa-lluq-qqaq-ler-lutik  
 ear-1sg.pos.abs/pl.posm-and hear-well-first-begin-3pl.CT  
**and** my ears first began to hear well

Conjoining paragraphs:

8. Taava kisianni\_apersortereerlunga,  
 taava kisianni apersortit-reer-lunga  
 then but confirm-already-1sg.CT  
 Then when I was confirmed however

nammineerlunga,  
 nammineer-lunga  
 do.by.oneself/be.independent-1sg.CT  
 when I myself did [this]

aalisarsinnaanngorama tassami;  
 aalisaq-sinnaa-nngor-gama tassami  
 fish-can-become-1sg.CA in.any.case  
 when I learned to fish [i.e. became able to fish] in any case

imaak--(taamanikkut ipuinnarmik angallateqarpugut  
 ima taamani-kkut ipu-innaq-mik angallat-qaq-vugut  
 so at.that.time-via oar-only-inst vessel-have-1pl.I  
 at that time we had only boats with oars

umiaasat, umiatsiaallu taamani angallatigineqarput)  
 umiaasaq-t umiatsiaaq-t-lu taamani angallat-gi-neqaq-vut  
 flat-bottom.rowboat-pl.abs rowboat-pl.abs-and at.that.time-via vessel-have-pas-3pl.I  
 flat-bottomed rowboats **and** rowboats in those days were used

Tassalu taamanikkut,  
 Tassa-lu taamani-kkut  
 that.is-and at.that.time-via  
**and** that is at that time

eqqaamalluarpara.  
 eqqaama-lluaq-vara  
 remember-well-trans.1sg.S/3sg.O.I  
 I well remember it

qassutit pi-- siullermik piniutigineqartut  
 qassutit-0 siullermik piniuti-gi-neqaq-tut  
 nets-abs at.first equipment-have-pas-3pl.P  
 the nets were used at first

As the enclitic *-lu* conjoins parallel structures and it further signals nothing about preceding discourse, in many cases, the constituents could be interchanged with no serious change in semantics. Finally, *-lu* does not signal a particular emphasis of one or the other of the constituents that it links.

*Aamma* is described as having various meanings associated with coordination; it is identified in the literature as a conjunctive particle in this respect. In looking at the instances of *aamma* in the texts, however, the particle does not act like the enclitic coordinating conjunction *-lu*. Most obviously, it does not conjoin parallel structures. It does link parts of the text, but these parts are not interchangeable. Rather, clauses headed by *aamma* are dependent on the preceding text. They are not necessarily syntactically marked as dependent; that is to say, they are not necessarily syntactically subordinate. Instead, it is semantically that they depend on preceding discourse. Notice in example 10 that the clauses with the particle *aamma* are in the indicative (i.e. independent) and contemporative (i.e. dependent) moods, respectively:

10. siullermik, seminariami atuaqataavoq  
 siullermik seminaria-mi atuaqat-u-voq  
 at.first seminary-loc schoolmate-cop-3sg.I  
 the first time he went to the seminary (teacher's school)

ima kursuserpoq  
 ima kursus-er-voq  
 like course-have.a.course-3sg.I  
 like to take courses

maannakkutoorlugu, 1929-imi.  
 maanna-kkut-tooq-lugu 1929-mi  
 now-via-like-trans.3sg.O.CT 1929-loc  
 it would be called now [was] in 1929

Taava, tamatuma kinguningaatsiarsuagut 1942-imi,  
 Taava tamatuma kinguneq-ngaatsiaq-suaq--agut 1942-mi  
 so this-rel result/succession-very.much-big-3sg.pos.via 1942-loc  
 so then much later in 1942

**aamma** kingumut ukiivoq Nuummi,  
 aamma kingumut ukii-voq Nuuk-mi  
 and again winter over-3sg.I Nuuk-loc  
**and** he again was one year [wintered over] in Nuuk

**aamma** seminariami atuaqataalluni  
 aamma seminaria-mi atuaqat-u-luni  
 and seminary-loc schoolmate-cop-3sg.CT  
**and** he learned [i.e. was a student] in the seminary

Example 11 shows the nature of this dependence even more clearly. The speaker started a thought, and the clauses immediately following the particle *aamma* are parenthetical to what the speaker started to say, and are therefore outside the main narrative:

11. Tassa Narsamut pigaagatta taamani,  
 tassa Narsaq-mut pi-gaan-gatta taamani  
 that.is Narsaq-term do-when-ever-1pl.CA at.that.time  
 when we got to Narsaq at.that.time

Narsaq **aamma** taamani mikisuarakasiugami  
 Narsaq-0 aamma taamani miki-soq-araq-kasik-u-gami  
 Narsaq-abs and at.that.time small-nom-small-dear-cop-3c.sg.CA  
**and** Narsaq was very small and dear at that time

inukitsuarakasiullunilu,  
 inuk-kit-suaraq-kasik-u-luni-lu  
 person-have.little-very.small.dear-cop-3c.sg.CT-and  
 and there were not so many people

ullumikkutut inngivikkami  
 ullumi-kkut-tut iC-nngit-vig-gami  
 today-via-eq neg.cop-neg-completely-3c.sg.CA  
 it is extremely different from today

Further, although *aamma* must not be classified as a conjunction but as a discourse particle, it does have characteristics of subordinating conjunctions, as described in Mosegaard Hansen. For example, it can be found with both the emphatic and coordinating enclitics (and even in the same word) and any number of other discourse connecting particles such as *tassa*, *imak*, and *taava*:

12. Ukiumi, terianniat, aqissit, ukallit,  
 Ukioq-mi terianniaq-t aqisseq-t ukaleq-t  
 winter-loc fox-pl.abs ptarmigan-pl.abs hare-pl.abs  
 In the winter [there were] foxes, ptarmigans, and hares

taavalu **aamma**, soorunalumi puisit,  
 taava-lu aamma sooruna-lu-mi puisit-t  
 then-and and of.course-and-intens seal-pl  
**and** then **and/also and** of course the seals

Upon closer inspection, dependence on preceding discourse is not a strong enough claim. In fact, the particle is overwhelmingly found where the following text is not only semantically dependent on preceding discourse, but it is a continuation thereof:

13. Taava, juumooqarpugut,  
 Taava juumooq-qaq-vugut  
 then midwife-have-1pl.I  
 we had a midwife

**aamma**, ilinniarsimanngitsumik,  
 aamma ilinniaq-sima-nngit-soq-mik  
 and learn-perf-neg-nom-inst  
**and** [she was] without learning [i.e. [she was] someone without learning]

This assertion is further strengthened when the occurrence of *aamma* is compared with that of other signals of thematic continuity in West Greenlandic. In my dissertation, I argued that marking topic and thematic continuation or change is signaled syntactically in the language. Thematic continuity is indicated with the use of the contemporative verb

mood, and thematic shift with the use of the participial verb mood. Topic continuity is indicated by absolutive case marking and by coreference marking between clauses; and topic shift by the use of antipassive constructions and switch-reference marking.

#### Thematic and Topic Continuity in West Greenlandic

|           |          | Continuity                             | Shift                           |
|-----------|----------|--|---------------------------------|
| Syntax    | Theme    | contemporative                         | participial                     |
| Syntax    | Topic    | absolutive case<br>coreference marking | antipassive<br>switch-reference |
| Discourse | Particle | <i>aamma</i>                           | <i>tassa, imak, taava</i>       |

What I find in my texts is that the particle *aamma* may appear in both transitive and intransitive constructions and with a number of verb moods, both dependent and independent, including notably the contemporative, which, again, signals thematic continuity (see ex. 10). There are, however, no examples of *aamma* with antipassive constructions, that is, with non-topics or new topics, and there are very rare examples of *aamma* in participial verb mood constructions, which indicate thematic shift (indeed, there are only 4 out of more than 50 instances of *aamma*, one of which is a repetition of a preceding participial for emphasis). In all of these examples, the topic remains unchanged, and these clauses may be said to continue the topic.

#### 14. Taamaattumik ajoqit imaannaanngitsumik,

Taamaattumik ajoqi-t imaannaanngi[soq] -mik  
 Therefore catechist-pl.abs ones.not.without.importance-inst  
 And therefore the catechists who are not without importance

qutsavissarai nunatta ullumikkut;  
 qutsavi-ssaq-gi-vai nuna-tta ullumikkut  
 thank-fut-have-trans.3sg S/3pl.O.I.land-1pl.pos today  
 our land should thank them today

**aamma** tamakku sulerujussuarsimasut;  
 aamma tamakku sulirujussuaq-sima-sut  
 and those work-very much-perf-3p. P  
**and** they worked a lot, those ones [i.e. the catechists (topic)]

imaannaanngitsorujussuarmik\_sulerujusima- sulisimasut,  
 imaannaanngitsoq-rujussuaq-mik sulirujussuaq-sima-sut  
 ones.not.without.importance-very great-inst work-perf-3pl.P  
 they worked in a very important/meaningful/able way

In my most recent paper, I found that some particles mark thematic or topic shift. Here, therefore, it is not unduly surprising to find continuity signaled by the use of a particle. This merely fills out a paradigm that has an analogue in the syntax. To return

briefly to the enclitic, *-lu*, on the other hand, may be found in phrases which continue the previous discourse theme or topic, but this is not obligatorily so, as you can see from example 8, and *-lu* cannot be said to indicate anything about the theme or topic.

In light of this, if *aamma* indeed marks thematic continuity within a discourse, then its association with emphasis may perhaps be understood as well. In general, once a topic or theme has been established, it is assumed to be maintained until some explicit notice of thematic shift is given (which accounts for the frequent overt markers of thematic shift in West Greenlandic). Thus, I'm tempted to think that marking continuity of theme or topic is a signal for markedness in some way. The use of an overt, independent marker implies something more than what is already assumed, and not surprisingly, it can imply emphasis – in particular, discourse emphasis (for examples, see below).

There are other ways of indicating emphasis, however, notably through the use of enclitics and suffixes. These often indicate emphasis of the particular word to which they are attached:

15. eqqaamagiga,  
 eqqama-giga  
 remember-trans.1sg.S/3sg.O.P  
 I remember it

eqqaamaqaara taamani\_  
 eqqaama-qi-vara                      taamani  
 remember-intens-trans.1sg.S/3sg.O.I at.that.time  
 I **really** remember it in those days

However, as Fortescue (1984:13) notes, there is often some ambiguity in interpreting the emphasis as lexical or clausal in scope: in the following example, it seems to me that it is unclear whether or not the emphasis is on the continuation (*aamma*) or on the propositional information 'not to make the story too long', or indeed on the emphatic nature of the particle *aamma* itself:

16. Ataataga imaannaanngitsorsuartut oqaatigineqarsinnaavoq;  
 Ataata-ga              imaannaanngit-soq-suaq-tut              oqaatigi-neqaq-sinnaa-voq  
 father-1sg.pos.abs not.without.importance-nom-big-eq say.about.one-pas-can-3sg.I  
 My father, he was said to be an exceptional person [i.e. was like one not without importance]

*My father was said to be an exceptional person; it can be said that my father was like an exceptional person;*



akuttugallarmata igaffillit,  
 akuttu-gallar-mata igaffik-lik-t  
 rare-yet/still/for.the.time.being-3pl.nc.CA kitchen-provided.with-pl.abs  
 because it was rare to have kitchens/kitchens were rare,

igaffilinnguaq, inilik nuannersorujussuaq  
 igaffik-lik-nnguaq-0 ini-lik-0 nuanneq-soq-rujussuaq  
 kitchen-provided.with-little-abs room-provided.with-abs nice-nom-very.much  
 a little kitchen a little room [was] very nice.

(**Aamma** kingorna uigigaluarma allivaa,  
 aamma kingorna ui-gi-galuaq-ma alli-vaa  
 and later husband-have-conseq-1sg.pos.rel grow-trans.3sg.S/3sg.O.I  
**and** later my late husband made it bigger

aqqaluara nuliaqalermat  
 aqqaluaq-ga nuliaq-qaq-leq-mat  
 little.brother-1sg.pos.abs wife-have-provide-3sg.nc.CA  
 when my little brother got married [had a wife]

meeqqiulerlunilu  
 meeqqior-leq-luni-lu  
 have.children-provide-3sg.CT-and  
**and** got children

**aamma** allinikuuaa;  
 aamma alli-nikuu-vaa  
 and grow-past-3sg.S/3sg.O.I  
**and/also** he made it bigger

sinittarfiit inilerlugit taakku immikkut.)  
 sinittarfik-it ini-leq-lugit taakku immi-kkut  
 bedroom-3pl.pos/pl.posm.abs room-provide-3pl.O.CT those-rel own  
 those ones built their own bedrooms/those ones made separate bedrooms

Where it occurs after, however, it may occur after a clause, although it most often occurs after a noun, another particle, or an adverb, and it seems to function as an emphatic particle rather than as a marker of continuation per se (see example 6, 11, and 18):

18. Taamalu, ullaassanngoriartornerani,  
 Taama-lu ullaassaq-nngor-riartor-neq-ani  
 then-and dawn-become-almost-nom-3sg.pos.loc  
 and then in the almost dawn time

seqernup nuiartornerani tassa,  
 seqineq-up nui-jartor-neq-ani tassa  
 sun-rel [sun].rises-more.and.more-nom-3sg.pos.loc that.is  
 in the sun's rising [i.e. when the sun is coming up/rising], you know

uernaleriartuaaq,  
 uerna-ler-riartuaaq  
 sleepy-nearly-gradually.more.and.more  
 [we] begin to be sleepy

seqineq kissakkiartuaartillugu; ilummut, assumut;  
 seqineq-0 kissaq-giartuaaq-tit-lugu ilummut assumut  
 sun-abs warm-gradually more and more-cause-3sg.O.CT to.the.inside to.windward  
 [it] is causing the sun to get warmer [the sun is getting warmer] to the inside to  
 windward

**aamma** tassa ullaakkut ullaassakkut **aamma**,  
 aamma tassa ullaq-kkut ullaassaq-kkut aamma  
 and you.know morning-via dawn-via and  
**and** you know in the morning, **and** at dawn

assarnaarajuttunnguugami;  
 assarnaar-gajug-soq-nngu-u-gami  
 wind.going.out.of.fjord-tendency-nom-small-cop-3c.sg.CA  
 there was a tendency to be a wind going out of the fjord

From the above examples, the following observations can be made:

1) Thematic shift and thematic continuity are important enough in West Greenlandic to be marked in a number of ways; one of these ways is through the use of particles. The examples above show that *aamma* is consistently found as an indication of thematic continuity in discourse. In this respect, it is consistent with West Greenlandic linguistic categorization, as we can see from the syntax. Further, just as there are particles which mark thematic shift, we now have a particle which marks thematic continuity.

2) For discourse particles, we need to look for discourse-based explanations of their functions. It would be inadequate to describe discourse particles in syntactic terms, as I have shown. It is, I suggest, from the discourse function of marking textual continuity that *aamma* derives its association with conjunction, although, as we have seen, it does not have the purely syntactic characteristics of the enclitic *-lu*.

3) In addition, I hypothesize that signaling continuity is in some respect marked, since the assumption is most probably that the theme or topic remains constant until there is some indication of change. If so, it is through this that *aamma* comes to be identified

as an indicator of textual focus, whence its link with emphasis. However, the emphasis is on a part of the text and not on a word or syntactic constituent, as it is for the enclitics.

These are preliminary studies based on only one kind of oral text. Presumably, speakers have varying strategies for different kinds of texts. However, there is enough data and enough cross-speaker consistency to suggest the existence of particular positions in the structural hierarchy of discourse, and these positions have particular requirements if they are to be filled. That is, they may be optionally left blank; but if they are filled, they must be filled by particles which fulfill the particular functions required by these positions. In West Greenlandic, there appear to be slots for, among others, marking thematic continuation and thematic shift, as I have shown here. There is tolerance for variety in which particle may have which function, as long as these, and not random, functions are indicated. Thus, particles may have multiple functions on the surface, but upon closer investigation, these functions are not randomly assigned.)

These observations are of course preliminary, and should be accepted cautiously. They do seem to be supported by evidence from other aspects of text structure in West Greenlandic, and must suggest the importance of studying discourse as a structural unit of language, not entirely dependent on pragmatics. If nothing else, however, they reveal interesting differences between the morphosyntactic enclitics and the discourse particles.

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## On the Naturalness of Unnatural Rules

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In the 1970's the approach of Natural Phonology focused on the observation that phonetically motivated ("natural") processes are common in the phonologies of the world's languages, while phonetically unmotivated ("unnatural") ones are uncommon (cf. Stampe 1969, Vennemann 1974, Hooper 1976, Donegan and Stampe 1979; for reactions at the time see, for example, Hellberg 1978 and Anderson 1981).

Much recent work, especially in Optimality Theory (Prince and Smolensky 1993), revives this general philosophy: the phonological system incorporates phonetic constraints on outputs, ranging from perceptibility of acoustic cues in particular contexts to the general principle of least effort (Flemming 1995, Steriade 1997, Myers 1997, Boersma 1998, Kirchner 1998). I present evidence that this approach makes false predictions regarding the historical development of phonological systems (cf. Ohala 1974, 1981, 1997, Kaye 1989, Hale and Reiss 1998, in press, Hyman 1998, Kingston 1999).

I argue that while phonetically driven approaches correctly identify the factors that lead to common alternations, it is problematic to incorporate these factors into the grammar itself. From the learner's (and the grammar's) point of view, the original cause of an alternation is irrelevant: the learner's only goal is to reproduce the language she hears around her.\*

### 1. Phonetically motivated vowel lowering

Although most of the processes to be discussed in this paper are not well motivated from a phonetic point of view, I begin by presenting a phenomenon that has clear motivation. One case of a phonetically natural, and therefore widely attested, pattern is lowering of vowels in proximity to a uvular consonant. I illustrate with examples from three languages. In West Greenlandic Eskimo, the vowels /i, u/ lower to approximately [ɛ, ɔ] when followed by either of the uvular consonants /q, ʀ/ (Schultz-Lorentzen 1945, Fortescue 1984). This process is allophonic; the only phonemic vowels are /i, u, a/. The examples below show the final vowel of the stem changing depending on the following suffixal consonant.

#### (1) WEST GREENLANDIC: Vowel lowering

|    |         |              |          |             |
|----|---------|--------------|----------|-------------|
| a. | sɛRmi-t | 'glaciers'   | sɛRmɛ-q  | 'glacier'   |
| b. | uvdlu-t | 'days'       | uvdlɔ-q  | 'day'       |
| c. | iki-t   | 'your wound' | ikɛ-Rput | 'our wound' |

This lowering has clear motivation in the similar articulations of the low uvular consonants and the lowered vowels.<sup>1</sup>

A similar lowering is found as a distributional generalization in Peruvian Quechua, though in this case it occurs on either side of a uvular stop, not just before a uvular (examples from Daza 1983). The relevant consonants are /q, q<sup>h</sup>, q̣/, which can be contrasted with /k, k<sup>h</sup>, ḳ/ that do not induce lowering.

(2) *QUECHUA: Vowel lowering*

|    |                                   |         |                        |                 |
|----|-----------------------------------|---------|------------------------|-----------------|
| a. | <u>ik</u> ma                      | 'widow' | eq <u>eq</u> o         | 'talisman'      |
| b. | k <u>ir</u> u                     | 'tooth' | q <u>er</u> u          | 'ritual mug'    |
| c. | <u>uk</u> uku                     | 'bear'  | o <u>nq</u> oy         | 'sickness'      |
| d. | <u>k</u> u <u>k</u> u <li>li</li> | 'dove'  | q <u>ol</u> q <u>e</u> | 'money, silver' |

This process, like that in Greenlandic, is also allophonic in origin, though widespread Spanish borrowing has introduced distinctive /e, o/ into the lexicon. Consequently there are many tokens of the mid vowels that have no triggering uvular consonant, and the distribution of high versus mid vowels is predictable only in the native vocabulary.

In Kashaya (Pomoan: N. California), all vowels collapse to [a] after a uvular stop /q, q<sup>h</sup>, q̣/ (Oswalt 1961, Buckley 1994a). This change neutralizes phonemic distinctions.<sup>2</sup>

(3) *KASHAYA: Vowel lowering*

|    |                           |   |                                      |                          |
|----|---------------------------|---|--------------------------------------|--------------------------|
| a. | sima:q-eti                | → | sima:qatí                            | 'although he's asleep'   |
| b. | ʔusaq-in                  | → | ʔusá:qan                             | 'while washing the face' |
| c. | ht-aq-i                   | → | taqá                                 | 'stretch your leg out!'  |
| d. | miku:ʔ-q-e:               | → | mikuʔ <sup>h</sup> qá:               | 'must have hummed'       |
| e. | p <sup>h</sup> i-ʔya:tq-w | → | p <sup>h</sup> iyát <sup>h</sup> qaw | 'recognize (pl)'         |

Historically, this affinity exerted a complementary pressure: uvulars before /i, e, u/ became velars (McLendon 1973). Here the phonetic tendency has been granted categorical influence.

While this lowering in Kashaya has the same ultimate phonetic motivation that is more transparently observable in Greenlandic and Quechua, the process has expanded far beyond the original phonetic tendency. This is a fundamental fact about phonologization of phonetic processes (cf. Hyman 1976), and one that I believe makes it quite impossible to include phonetic motivations in the phonology: becoming divorced from phonetics is the very essence of phonology. Kashaya lowering by itself is a serious challenge to phonetically driven accounts of phonology, since the diachronic trend has clearly been to move away from the phonetic motivation. The following sections make this point more dramatically by means of processes that are quite unnatural, even if many of them originated in phonetically motivated alternations.

## 2. A "crazy rule" in Pomoan

Bach and Harms (1972) use the term "crazy rule" to describe rules that make no phonetic sense. An excellent example of such a rule is found in the Southern Group of Pomoan (Kashaya, Southern Pomo, and Central Pomo). According to this odd but quite productive rule, a vowel that normally surfaces as [i] occurs as [u] after [d] (Oswalt 1976). Examples here are from Kashaya (Oswalt 1961, Buckley 1994a).

(4) *KASHAYA: Singular imperative -i*

|    |           |   |                     |              |
|----|-----------|---|---------------------|--------------|
| a. | šu-qa:t-i | → | šuqa:t <sub>i</sub> | ‘groan!’     |
|    | du-še:k-i | → | duše:k <sub>i</sub> | ‘pleat it!’  |
| b. | wa-ad-i   | → | wa:du               | ‘come here!’ |
|    | cad-i     | → | cad <sub>u</sub>    | ‘look!’      |

(5) *KASHAYA: Same-speaker simultaneous -in*

|    |             |   |                      |                               |
|----|-------------|---|----------------------|-------------------------------|
| a. | mo-mul-in   | → | momú:l <sub>in</sub> | ‘while running around’        |
|    | du-kis-in   | → | dukis <sub>in</sub>  | ‘while scratching’            |
| b. | mahsad-in   | → | mahsad <sub>in</sub> | ‘while taking away’           |
|    | mo-aq-ad-in | → | mo:qad <sub>in</sub> | ‘while running out from here’ |

(6) *KASHAYA: Suppositional -inś*

|    |          |   |                    |                         |
|----|----------|---|--------------------|-------------------------|
| a. | ʔ-inś-e: | → | ʔinśe:             | ‘I suppose’             |
| b. | cad-inś  | → | cad <sub>inś</sub> | ‘I wonder if he saw it’ |

(7) *KASHAYA: Conditional -iʔba*

|    |              |   |                         |                    |
|----|--------------|---|-------------------------|--------------------|
| a. | qo-c-iʔba-em | → | qoc <sub>iʔ</sub> bem   | ‘could drink that’ |
|    | da:qač-iʔba  | → | daqa:č <sub>iʔ</sub> ba | ‘would like it’    |
| b. | cič-id-iʔba  | → | cič <sub>i</sub> :duʔba | ‘would do’         |

The reconstruction of Pomoan aspectual suffixes by Mithun (to appear) points to the origin of this unusual pattern in a reanalysis of morphological juncture in one extremely common suffix, the Durative. Briefly, what began as *\*-adu* took on the variants [ad] and [adu] depending on whether the final vowel was necessary for syllabification. In this earlier stage, deletion of the /u/ in underlying /adu/ occurred whenever there was no adjacent consonant that would be stranded as a result. At a later stage, however, the morpheme was reinterpreted as underlying /ad/, with insertion of [u] where it was necessary to syllabify an adjacent consonant. Since this historical morpheme came to be part of many composite aspectual and movement suffixes, the phonological environment was generalized such that the epenthetic vowel, normally [i], became [u] after any [d] regardless of its origin. It was then a short step to change even underlying /i/ to [u] in this context.

Because this rule has spread widely to other suffixes, it must be encoded in the grammar just like the more phonetically motivated rule [i] → [a] after [q]. (The changes to [a] and to [u] are equally productive.) In fact, it is the organization of the grammar, or the learning process, that must have led to the generalization of the rule beyond its original morphological context. For example, learners (like linguists) prefer purely phonological rules to morphologically conditioned ones. They apparently also prefer epenthesis to syllabically conditioned deletion. The [u] rule has remained in these languages for perhaps a thousand years despite its phonetic arbitrariness. If phonetic naturalness were a significant direct pressure on the phonology, this rule should have been abandoned rather than being extended to new domains. What rules like this (and those below) indicate is that naturalness is not a concern of the learner, nor of the mental grammar she constructs.

### 3. Zuni (hyper)palatalization

In Zuni, the velars /k, k̄/ are palatalized to [kʲ, k̄ʲ] before /i, e, a/ (Newman 1965, 1996, Walker 1966, 1972, Michaels 1971). Further, the /a/ in this context is fronted to [æ].<sup>3</sup>

(8) *ZUNI: fronting of velars before nonround vowels*

|    |            |   |             |                 |
|----|------------|---|-------------|-----------------|
| a. | kiwihcinne | → | kʲiwihcinne | 'kiva'          |
|    | la:ki      | → | la:k̄ʲi     | 'today'         |
| b. | kemme      | → | kʲemme      | 'leather'       |
|    | ʔake       | → | ʔakʲe       | 'large metate'  |
| c. | wehka      | → | wehkʲæ      | 'Eastern Keres' |
|    | kaweʔ      | → | k̄ʲæweʔ     | 'water'         |

A related fact regarding the interaction of velars and vowels is that before a round vowel, the velars and labiovelars do not contrast. This situation arose, of course, because the velar is phonetically rounded by coarticulation with the following vowel, as is any consonant before [u, o]. But since in Zuni only /k, k̄/ contrast with a rounded series, namely /kʷ, k̄ʷ/, it is only here that the coarticulation has phonological consequences. Traditionally, a velar preceding a rounded vowel is transcribed as unrounded, since that is the phonologically unmarked value for this contrast (as in Newman 1965:20, the source of these examples); but to reflect articulatory reality, I show the noncontrastive velar as (phonetically) rounded. The important point is that neutralization of rounding occurs.

(9) *ZUNI: loss of rounding contrast before round vowels*

|    |            |   |            |                               |
|----|------------|---|------------|-------------------------------|
| a. | ʔakʷi-ʔka  | → | ʔakʷiʔkʲæ  | 'it was inserted'             |
|    | ʔakʷ-u-ka  | → | ʔakʷukʲæ   | 'he caused it to be inserted' |
| b. | ʔehkʷi-ʔka | → | ʔehkʷiʔkʲæ | 'he was first'                |
|    | ʔehkʷ ʔona | → | ʔehk̄ʷona  | 'one who is first'            |

These representations assume that sequences generally treated as (underlying) simple velars followed by rounded vowels have, phonetically, noncontrastive anticipatory rounding on the consonant.

(10) *ZUNI: noncontrastive rounding of velars before round vowels*

|    |        |   |         |               |
|----|--------|---|---------|---------------|
| a. | ʔa:ku  | → | ʔa:k̄ʷu | 'purple sage' |
| b. | k̄okši | → | k̄ʷokši | 'be good'     |

Thus the neutralization of the contrast between /ku/ and /kʷu/ is phonetically in favor of [kʷu], even if the transcription <ku> is more typical for the outcome of both sequences. It is important to remember that my use here of the notation [ʷ] before [u, o] merely indicates a degree of coarticulatory rounding on the consonant no greater than the lip rounding that occurs during the following vowel.

Although the lack of historical and comparative data for Zuni prevents a definitive scenario, I propose that the [kʲæ] pattern in (8c) began with a minor fronting of a velar

consonant before a non-back vowel to reduce articulatory effort in the transition from [k] to [i, e], but then generalized to /a/. Notably, the /a/ vowel itself now shows the fronting effect of the preceding [kʲ].

- |      |    |   |             |             |             |
|------|----|---|-------------|-------------|-------------|
| (11) | a. | <i>phonetic coarticulation</i>            | <u>kʲ</u> i | ka          | <u>kʷ</u> u |
|      | b. | <i>generalization to unrounded vowels</i> | kʲi         | <u>kʲ</u> a | kʷu         |
|      | c. | <i>effect of consonant on vowel</i>       | kʲi         | <u>kʲ</u> æ | kʷu         |

At step (a) the low vowel is alone in not causing some change in the preceding velar consonant. Since /a/ lacks the feature [+round], labialization is an unlikely development; instead, I suggest that at step (b) speakers eliminated the inertness of /a/ by extending the fronting pattern to all non-round vowels, including /a/. Eventually the frontness of the velar exerted an effect on the vowel, causing /a/ to surface as [æ] in exactly this context. Of course, since /kʲ/ does not exist as a phoneme in Zuni, no neutralization of contrast occurs before [i, e, æ], unlike with /kʷ/ before /u, o/ — perhaps another reason why /a/ joined the fronting rather than rounding pattern.<sup>4</sup>

Fronting of velars before front vowels is very common and phonetically unsurprising (cf. Ladefoged and Maddieson 1996: 33). But this originally natural effect has been extended and exaggerated so much that the result is quite unnatural. Both the strongly palatalized consonant [kʲ] and the low front vowel [æ] are cross-linguistically marked, in particular when compared to the other possible pronunciation, simple [ka]. The latter is attested in Zuni, especially in the pronunciation of loanwords (see Michaels 1971 and references therein).

(12) *ZUNI: non-fronting before [a] in loanwords*

- |    |                   |                        |
|----|-------------------|------------------------|
| a. | melika            | ‘white man’            |
| b. | ka:po             | ‘cowboy’               |
| c. | kaču:čan poʔyanne | ‘railroad (man’s) cap’ |

The change in the native vocabulary from /ka/ to [kʲæ] is completely severed from its original phonetic motivation; synchronically it is an arbitrary rule that defies principles of articulatory ease and segmental markedness. (Cf. Modern Greek with the same vowel inventory and palatalization of velars before [i, e] but not before [a].)

A further example of the phonologized status of this rule is the opaque distribution of [k] and [kʲ] in cases of elision, where the (non)triggering vowel has been deleted (Davis 1966).

(13) *ZUNI: elision and its interaction with velar fronting*

- |    |                  |   |               |                    |
|----|------------------|---|---------------|--------------------|
| a. | suskʲi ʔokʷikʲæ  | → | suskʲokʷikʲæ  | ‘coyote woke up’   |
| b. | ʔanakʲo ʔelaʔkʲæ | → | ʔanakʲelaʔkʲæ | ‘the fox stood up’ |

For additional discussion of how the Zuni pattern may have arisen, see section 7.

#### 4. Reinterpretation of vowel length in Menominee

In Menominee (Bloomfield 1962, Hayes 1995), vowel length is subject to several changes depending on foot structure, which is iambic (right-strong quantity-sensitive), from left to right. The final consonant is extrametrical, so final syllables behave as open syllables.

(14) *MENOMINEE: lengthening of strong vowel in the first foot*

|    |               |   |                |                               |
|----|---------------|---|----------------|-------------------------------|
| a. | natom-a:-w    | → | (nato:)(ma:)w  | ‘he is called’                |
|    | ne-natom-a:-w | → | (nena:)(toma)w | ‘I call him’                  |
| b. | nekan-a:-w    | → | (neka:)(na:)w  | ‘he is left’                  |
|    | ke-nekan-a:-w | → | (keng:)(kana)w | ‘you <sub>sg</sub> leave him’ |

This uniform lengthening happens only in the first foot of the word. In later feet, a long vowel will actually shorten if the strong vowel is in an open syllable (cf. the previous examples). In a closed syllable, however, lengthening also happens in non-initial feet.

(15) *MENOMINEE: shortening of strong vowel in a non-initial foot (open syllable)*

|    |                |   |                 |                                    |
|----|----------------|---|-----------------|------------------------------------|
| a. | ahsam-a:-w     | → | (ahsa:)(ma:)w   | ‘he is fed’                        |
|    | net-ahsam-a:-w | → | (neta:h)(sama)w | ‘I feed him’                       |
| b. | nekan-ε:k      | → | (neka:)(ne:)k   | ‘when you <sub>pl</sub> leave him’ |
|    | ne:kan-ε:k     | → | (ne:)(kanε)k    | ‘when you <sub>pl</sub> left him’  |

(16) *MENOMINEE: lengthening of strong vowel in a non-initial foot (closed syllable)*

|    |                |   |                    |                       |
|----|----------------|---|--------------------|-----------------------|
| a. | payo:se-yan-en | → | (payo:)(seya)nen   | ‘whenever I embark’   |
|    | payo:se-yahken | → | (payo:)(seyah)ken  | ‘whenever we embark’  |
| b. | nekan-ehwa:ʔ   | → | (neka:)(nehtua)ʔ   | ‘when they are left’  |
|    | ne:kan-ehwa:ʔ  | → | (ne:)(kanɪh)(tua)ʔ | ‘when they were left’ |

These last examples are quite surprising compared to iambic lengthening in other languages (Hayes 1995, Buckley 1998): more often it is closed syllables that resist lengthening, and we certainly do not expect shortening of the stressed vowel. Part of the answer is that coda consonants in Menominee do not make the syllable heavy, but it is still a “crazy rule”.

Hayes (1995: 220) notes that “the best account of such rules often is to reconstruct their diachronic origins, explaining them away as the synchronically unnatural result of a sequence of natural changes.” He proposes the following possible scenario.

**STAGE 1: Lengthen vowels** in the heads of disyllabic feet (normal iambic lengthening).

$$(17) \quad (\text{osá:})(\text{mepé:h})(\text{katá:})\text{m} \quad = \quad [\text{osá:mepé:hkatá:m}]$$

**STAGE 2:** Long vowels in non-initial feet are “somewhat reduced” in their phonetic duration. This is plausibly in contrast to a main stress on the first foot.

$$(18) \quad (\text{osá:})(\text{mepè:h})(\text{katà:})\text{m} \quad = \quad [\text{osá:mepè:hkatà:m}]$$

**STAGE 3:** By restructuring, the phonetically intermediate-length vowels in non-initial feet are analyzed as phonologically short, but just in open syllables. Long vowels are normally shorter in closed syllables (Maddieson 1985), so these remain phonologically long.

(19) (osá:)(mepé:h)(katá)m = [osá:mepé:hkatá:m]

At this stage the contrast in degree of stress is likely gone, so that the difference in phonetic duration between stressed vowels in initial and non-initial feet cannot be attributed to metrical structure, and has to be attributed to phonological length.

**STAGE 4:** Loss of the intermediate length in the phonetic realization of short stressed open syllables. Present rule system, with lengthening and shortening in crazy environments.

(20) (osá:)(mepé:h)(katá)m = [osá:mepé:hkatám] 'he waters it to excess'

Thus while the modern situation may have resulted from small motivated changes, the end result is in some regards the opposite of the natural situation; yet the rules have remained vigorous.

## 5. Ojibwa palatalization

Eastern Ojibwa further illustrates the fact that what begins as a natural phonetic process often becomes part of a phonetically opaque alternation (Bloomfield 1946, 1957, Kaye 1978, Piggott 1980). In the proto-language, /t, θ/ palatalized to [č, š] before [i, i:, y].

(21) *PROTO-ALGONQUIAN: palatalization*

- |    |                 |                     |
|----|-----------------|---------------------|
| a. | *pema:t-esi-wa  | 'he lives'          |
|    | *pema:č-ih-e:wa | 'he makes him live' |
| b. | *mi:ka:θ-e:wa   | 'he fights him'     |
|    | *mi:ka:š-i      | 'fight him!'        |

This place assimilation can be motivated on the grounds of ease of articulation. But various subsequent changes in the daughter languages have obscured the original phonetic plausibility; for example, in Ojibwa \*θ became [l] and then [n], leading to the unusual alternation [n] ~ [š].

(22) *OJIBWA: sound changes*

- |    |  |                             |
|----|--|-----------------------------|
| a. | *θ AND *l MERGE AS [l] (attested in 17th century)                  |                             |
|    | <b>palatalization extended</b> to reflexes of *l in addition to *θ |                             |
|    | *na:θ  | ki-na:n-a: 'you fetch him'  |
|    |  | ki-na:š-i-mi 'you fetch us' |
|    | *mi:l  | ki-mi:n-a: 'you give him'   |
|    |  | ki-mi:š-i-mi 'you give us'  |

- b. [l] FROM \*θ AND \*l MERGE WITH [n] (beginning of 19th century)  
palatalization **not** extended to reflexes of \*n; rule undergoer becomes **opaque**

\*we:pin̩      ki-**we:pin**-a:      ‘you leave him behind’  
                 ki-**we:pin**-i-mi      ‘you leave us behind’

- c. SHORT FINAL VOWELS DELETE  
rule trigger becomes **opaque**: original **trigger** of palatalization is lost

\*-i              ki-**mi:š**                      ‘you give me’ (from \*ki-**mi:š-i**)

- d. \*e MERGES WITH [i]  
rule trigger becomes **more opaque**: it applies only before some tokens of [i]

\*i              ki-**mi:š-i**-mi              ‘you give us’  
\*e              ki-**mi:n-in**                  ‘I give you’

The alternation between [n] and [š], though unnatural and opaque, remains quite productive in inflectional paradigms, while the natural alternation between [t] and [č] has been restricted in its range of application. For example, where we find stem-final [n]~[š] we find nonalternating [t].

(23) *OJIBWA: loss of t~č alternation*

- a. \*nesič-i              >      nisit                      ‘my foot’  
b. \*nesit-ali              >      nisit-an                  ‘my feet’

The natural rule was curtailed, rather than the unnatural one. Kaye (1978: 154) attributes this change to “historical accident”:

- (24) Recall that l-palatalization is well established in the inflectional morphology, particularly in the verbal morphology. This is due to the fact that many T[ransitive] A[nimate] verb stems ended in \*θ and \*l. Within the TA paradigm there are several suffixes which began with \*i. So it is here that the alternations show up. On the other hand, no TA verb stem ended in \*t, and as a result, no t~č alternations appear within verbal paradigms. Perhaps it was because of this lack of support that all noun alternations involving t~č came to be lost.

In other words, what matters to the learner is how well attested an alternation is, not whether it is phonetically motivated. If the alternation is clear, it will be learned; otherwise it may be lost.

## 6. Belief systems

The processes discussed in this paper lead to the same conclusion that many others have reached before. An effective summation comes from Hyman (1975: 181f):

- (25) Although sound changes are sometimes blocked by considerations within a paradigm [...] no corresponding force has been discovered which would strive to keep rules natural. Instead, the above examples show the great tendency for rules to become unnatural [...] that is, to lose their phonetic plausibility and become morphologically conditioned.

Under this sort of view, which we can call the Cognitive view, the phonology is a computational system that manipulates abstract categories and does not incorporate information about phonetic naturalness. The following two substitutions are therefore equally acceptable.

- (26) a.  $i \rightarrow e / \text{q} \_ \_$  (cf. *Greenlandic and Quechua*)  
 b.  $i \rightarrow u / \text{d} \_ \_$  (cf. *Kashaya*)

Under a view that does incorporate information about phonetic naturalness into the grammar, which we can call the Phonetically Driven model, rule (a) is easy to express, while (b) must be treated as arbitrary. Quite schematically:

- (27) a.  $i \rightarrow e / \text{q} \_ \_ \Rightarrow$  "Sacrifice vowel height to articulatory ease"  
 b.  $i \rightarrow u / \text{d} \_ \_ \Rightarrow$  ARBITRARY SUBSTITUTION (*however that is formalized*)

But this distinction is actually the same one that is expressed by markedness in standard generative approaches to phonology, such as feature geometry (cf. a distinction I made for these very rules in Buckley 1994a).

- (28) a.  $i \rightarrow e / \text{q} \_ \_ \Rightarrow$  "Spread [+low] from a uvular to a following vowel"  
 b.  $i \rightarrow u / \text{d} \_ \_ \Rightarrow$  "Insert [+round] after /d/"

Natural assimilation rules are formalized by autosegmental spreading, while unnatural rules (to the extent they are discussed) require other operations, here arbitrary insertion. But if arbitrary insertion rules can be learned, and seem to be unpenalized in the historical development of languages, why create another, superfluous mechanism such as spreading?

It seems to me the matter hinges on two views that can be stated roughly as follows.

- (29) a. *Principle of Phonetic Explanation*: Many or most phonological patterns are explained by detailed phonetic properties of human language, such as the robustness of acoustic cues and the ease of specific contextual articulations.  
 b. *Principle of Explanatory Phonology*: The explanations of phonological patterns are represented in the mental grammar. A phonological process is "natural" to the extent that it is easily expressed by the tools of the theory.

Phonetically Driven Phonology is the Standard Markedness model brought to its logical conclusion, taking seriously the question of what makes a process natural. A schematic analysis of views:

(30)

|                                  | <i>Phonetic<br/>Explanation</i> | <i>Explanatory<br/>Phonology</i> |
|----------------------------------|---------------------------------|----------------------------------|
| a. Standard Markedness Phonology | NO                              | YES                              |
| b. Phonetically Driven Phonology | YES                             | YES                              |
| c. Cognitive Phonology           | YES                             | NO                               |

I believe that Phonetically Driven phonology is correct is attributing the motivation of many phonological patterns to the phonetics; but mistaken in the further (traditional) step of incorporating this motivation into the mental grammar.

## 7. A Cognitive Approach

I use the term “Cognitive” to evoke a theory of phonology that takes seriously the ideas of cognitive science, in particular the mind as a computational system (cf. Kaye 1989, Lakoff 1993). For general discussion, see especially Hale and Reiss (1998, in press).

A basic point: If the child learner can master strange and complex alternations without apparent prejudice, there is no reason to think that natural processes are easier to learn (i.e. more easily accommodated by the tools of the mental grammar). In fact, the learner will treat natural alternations as if they are arbitrary — which is accurate, since no language exhibits every phonetic tendency in its phonology. The set of rules in a language, even if all are natural, is synchronically an arbitrary subset of all possible natural (and unnatural) rules.

The cross-linguistic frequency of “natural” processes is explained by the fact that all languages are produced in the same phonetic universe. Briefly, the nature of production and perception of phonetic signals exerts its influence in the transmission of language from generation to generation. If, for example, some featural distinction is difficult to perceive in some context, the child may fail to hear the distinction and constructs a grammar that neutralizes it.

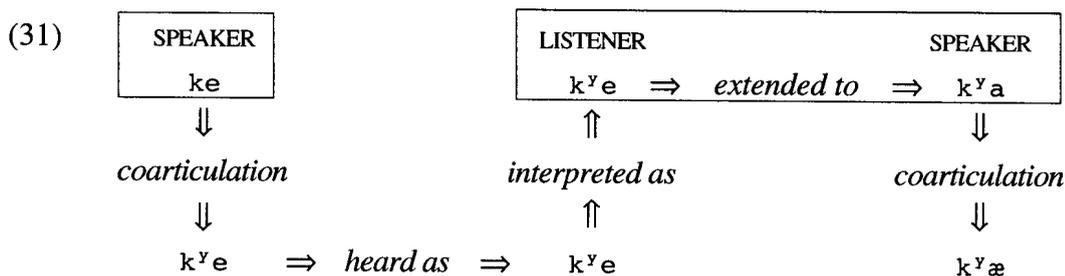
Optimality Theory — which, in its standard variety, falls into the Markedness category (32a) — is particularly welcoming to Phonetically Driven approaches. It is centered around the motivations of various phonological patterns, such as epenthesis being triggered by NoCODA (“Syllables do not have codas”). It is a relatively easy step to reformulate this motivation in more phonetic terms, referring to the difficulty of perceiving most consonantal cues without a release into a following vowel.

The question of interest is whether a grammar treats “natural” and “unnatural” processes differently, and the answer appears to be “no”. The unnatural situations discussed above, and countless others, have persisted in their languages for many

centuries, indicating that once an alternation comes about (whether for phonetic or other reasons), the child simply learns it without regard to its original motivation.

What remains for phonology to investigate is precisely the ways in which phonetic variation is structured by learners. For example, the extension of Zuni palatalization from [i, e] to [a] suggests the mental reality of distinctive features like [back] or [round]. And the restructuring of Menominee vowel length rules is just as dependent on the categories Foot and Syllable as is more usual iambic lengthening. Further, the special status of the first foot indicates that reference to a peripheral constituent is necessary — as opposed to unattested notions such as “third from the right”.

Borrowing a style of diagram from Ohala (1981), here is an illustration of what may have happened in Zuni that led to the strange pattern /ka/ → [kʲæ].



Essentially, phonology proper — what requires cognitive explanation — is what happens “inside the box”, such as the extension of the Zuni fronting pattern to /a/ on the basis of properties it shares with /i, e/, i.e. lack of rounding. The impetus for the extension is also cognitive, i.e. the desire to join /a/ in one of the existing patterns of velar+vowel interaction. The fact that velars are fronted before [i, e] has an easy physical explanation, which makes its representation in the cognitive domain unnecessary. In fact, the easy survival of unnatural rules indicates that facts with easy physical explanations should **not** be represented in the mental grammar.

In conclusion, our understanding of phonetic naturalness belongs in the physical context where sounds are transmitted from speaker to hearer, and not (redundantly and problematically) in the grammar that a learner constructs in response to these sound patterns. For the learner, all rules in her language are natural.

### Notes

\* For comments and discussion I would like to thank the participants at WAIL, in particular Marianne Mithun, as well as Tony Kroch and Charles Reiss.

<sup>1</sup> Maddieson and Ladefoged (1996: 36) discuss the acoustic effect of uvulars in the backing of vowels, but do not mention an acoustic lowering effect. The phenomenon here thus appears to be articulatory rather than auditory — the lowering of the tongue dorsum for the uvular closure brings with it lowering of the entire tongue body, including the anterior region chiefly responsible for the vowel articulation.

<sup>2</sup> A complication arises in certain morphemes that Buckley (1994a) analyzes as containing a rounded uvular /qʷ/; in this context any following vowel surfaces as [o], which differs phonologically from [a] only in the feature [round]. See also Buckley

(1994a,b) for restricted contexts where the vowel /i/ raises the preceding uvular to [k], and where a nonlow vowel is permitted adjacent to an underlyingly rounded uvular.

<sup>3</sup> While the nature of Zuni palatalization has been much discussed, these discussions have focused on borrowings in which /ka/ surfaces without a fronted consonant (see (12)). The usual fronting effect on the vowel, though quite obvious to the ear, has generally been ignored in the literature; Walker (1972) is an exception in giving explicit representations of words with the fronted vowel [æ].

<sup>4</sup> An alternative scenario is that, at a previous stage in the history of Zuni, the low vowel had a front articulation [æ] in all contexts, causing fronting of the velar quite naturally; but later the vowel was in general backed, except when preceded by [kʷ]. Even under this story, however, the conclusion remains that what began as a phonetically motivated process has become unnatural: underlying /ka/ must still surface as [kʷæ].

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# Child Acquisition of the Quechua Affirmative Suffix

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## Introduction

Quechua, the dominant language of the Inca empire, is today spoken in several distinct varieties by over eight million people in Peru, Bolivia, Ecuador, Argentina, and Colombia (Cerrón-Palomino, 1987). The language is agglutinative, with morphologically complex words assembled entirely through suffixation. Although the canonical word order is Subject-Object-Verb, the language allows great flexibility in the ordering of matrix constituents. Quechua speakers, even small children, produce all six possible word orders, although post-verbal subjects are rare in adult speech.<sup>1</sup>

Quechua also exhibits an array of suffixes which indicate both the epistemic status and the primary focus of sentences. This study considers the Affirmative suffix, -mi/-n, which fulfills three functions in Quechua discourse. First, it marks a constituent as the primary focus of the sentence. Second, the suffix serves an evidential function: it indicates the speaker's information source as direct, attested, first-hand evidence. Finally, it performs a validation function: -mi/-n marks assertions and indicates conviction, whether or not the corresponding evidence is first-hand.<sup>2</sup>

Given these diverse functions, the present study explores the acquisition of the Affirmative suffix by young children learning Quechua as their first language. Previous studies in the acquisition of languages such as English and French (e.g. Moore & Davidge, 1989; Hickman, Champaud & Bassano, 1993) suggest that appropriate use of the devices for expressing epistemic modality develops gradually. An analysis of the spontaneous speech of four children undertaken by Bloom, Rispoli, Gartner & Hafitz (1989) revealed appropriate use of the cognitive verbs think and know for expressing degrees of certainty by the age of 3;0. By contrast, Moore & Davidge discovered empirically that children do not fully understand the uses of the verbs know, be sure, and think for expressing degrees of certainty until the age of 4;0 or 5;0. In a study of the acquisition of Turkish evidentials, Aksu-Koç (1988) found that four-year-olds could distinguish witness and nonwitness perspectives; however, it was not until the age of seven that children sorted out the rules governing the use of the evidentials marking direct and indirect evidence.

In light of findings such as these, I consider two questions. How and when do children first make use of the Quechua Affirmative suffix? Are there other strategies available to children for expressing assertions and emphasizing sentence elements before they have begun making use of the Affirmative suffix?

## Functions of Affirmative -mi/-n

### *The Focusing Function*

As observed by Muysken (1995 and elsewhere), the evidential suffix marks a constituent as the primary focus of the sentence, unless the constituent occurs sentence-initially or immediately following the topic(s). Quechua scholars (notably, Muysken, Weber, 1986; and Nuckolls, 1993) concur that the sentence element marked by the evidential suffix as the primary focus usually constitutes rhematic material, or "new" information. Since constituents occurring in sentence-initial position are generally considered to convey thematic or "given" information, it is not surprising that the evidential-bearing constituent in a Quechua proposition is rarely focused when it occurs as the first element in the utterance.

Two of these suffixes are shown in (1-3), with approximate English glosses indicating the sentence focus. In each example, the focused constituent is the direct object misk'i-ta 'sweets'.<sup>3</sup>

- |    |  |                    |
|----|--|--------------------|
| 1. | Juan misk'ita- <b>n</b> munan.<br>Juan sweets-Acc-AF want-3 subj<br>'It is SWEETS that Juan wants.'            | Assertion          |
| 2. | Juan misk'ita- <b>s</b> munan.<br>Juan sweets-Acc-RE want-3 subj<br>'It is reportedly SWEETS that Juan wants.' | Report ("Hearsay") |
| 3. | Juan misk'ita- <b>cha</b> munan.<br>Juan sweets-Acc-DU want-3 subj<br>'It must be SWEETS that Juan wants.'     | Conjecture         |

In (1), this element is focused in an assertion through attachment of the Affirmative suffix. In (2), the Reportative suffix occurs on the focused element in a so-called "Hearsay" statement. Finally, in (3), it is the Dubitative suffix that appears on the focused element, since the sentence expresses a conjecture.

*The Epistemic Functions* The conjectural function of Dubitative -cha is not disputed: it occurs in propositions which are inferential. By contrast, there is some controversy regarding the epistemic functions of the Affirmative suffix. Muysken and Weber, among others, propose that the suffixes are mainly evidential (and not validational). On their view, the suffixes indicate the speaker's source of information: direct, attested, first-hand evidence as contrasted with indirect, second-hand evidence such as hearsay.

However, Nuckolls and Floyd (1997) claim a validational function. Nuckolls notes that speakers of Pastaza Quechua, at least, make use of the Affirmative suffix to mark constituents in utterances concerning future happenings, events which they could not possibly have directly attested or experienced. The author presents compelling evidence that the most prominent function of the Affirmative suffix is *asserting*, that is, expressing personal conviction or belief rather than direct experience.

One example of the asserting function is the means available to Quechua speakers for responding affirmatively to direct questions. In (4), I present an adult-like reply to the question, Pukllashan-chu 'Is he playing?'. In the affirmative reply, the respondent repeats the questioned constituent, replacing Interrogative -chu with the Affirmative suffix.

- |    |   |
|----|---|
| 4. | Direct Question: Puklla - sha - n - <b>chu</b> ?<br>Play Prog 3 subj Interr<br>'Is he playing?' |
|----|---|

Affirmative Reply: (Arí), puklla - sha - n - **mi**.  
 Yes play Prog 3 subj AF  
 '(Yes), he is playing.'

The evidential and validational functions are closely related. I assume, in the present study, that children acquiring Quechua as their first language must learn three functions for Affirmative *-mi/-n*: (1) morphosyntactic focus; (2) evidentiality; and (3) assertion.

### The Data

The present analysis concentrates on the naturalistic speech of three children, ages 2;5 to 3;2. The children, two girls and a boy, were recorded in their home community of Chalhuanca, a village located in the Caylloma Province of Arequipa in southern Peru. Two of the children, Hilda and Juan, were each recorded for an approximate total of five to six hours over a four-month period, while the third child, Ana, was recorded for eleven hours over a period of six months. The audiotapes were transcribed by native speakers of the Cuzco-Collao variety of Quechua. Table 1 summarizes information on the ages at which each child was recorded, in years and months. For the purpose of analysis, the corpus of utterances produced by Ana was divided into three groups according to age.

Table 1: *Quechua-learning children by age at recording*

|       |            |            |             |             |            |
|-------|------------|------------|-------------|-------------|------------|
| Ana   | 2;5<br>2;6 | 2;7<br>2;8 | 2;9<br>2;10 |             |            |
| Hilda |            |            | 2;10        | 2;11<br>3;0 | 3;1        |
| Juan  |            |            |             |             | 3;0<br>3;2 |

*Ana* In the first age range, 2;5 to 2;6, Ana's utterances lacked independent suffixes altogether. In (5-8), for example, we find Ana producing utterances without the Affirmative suffix or topic marker *-qa*. In such expressions, with copula ellipsis, these suffixes are required in adult speech. The appropriate forms are shown in parentheses after each of Ana's utterances.

5. Wasi - pi usitu. (Wasi - pi - **n** / Wasi - pi - **qa**)  
 House Loc bear  
 'The bear is in the house.'
6. Chay uvija. (Chay - **mi** / Chay - **qa**)  
 That sheep  
 'That's a sheep.'

7. Usu pay. (Pay - **mi** usu)  
 Bear 3 pron  
 'He's a bear.'
8. Vaca Yoni - \_\_\_\_\_. (Vaca - **n** / Vaca - **qa**)  
 Cow Yoni (Gen)  
 'The cow is Yoni's.'

In (9-11), I present three of Ana's affirmative replies to direct questions. In these examples and in those that follow, the abbreviation "IL" indicates the interlocutor. Typically, during this first age range, Ana responded by producing utterances with first-person pronoun subjects in post-verbal position, instead of the Affirmative suffix.

9. IL: Apa-nki?  
 Take-2 subj  
 'Will you take it?'  
 Ana: Apa-n\_ **noqa**. Appropriate: (Arí,) apa-saq-**mi**.  
 Take-3 subj 1 pron (Yes) take-1 fut-AF  
 'I take it.' 'Yes, I will.'
10. IL: Puklla-q-**chu** puri-nki?  
 Play-Agt-Interr go-2 subj  
 'Will you go to play?'  
 Ana: Puklla\_ **noqa**. Appropriate: (Arí,) puklla-q-**mi**.  
 Play-(1 subj) 1 pron (Yes) play-Agt-AF  
 'I play.' 'Yes, to play.'
11. IL: Wayk'u-ru-nki-ña-**chu**?  
 Cook-Exh-2 subj-Disc-Interr  
 'Have you already cooked?'  
 Ana: Wayk'u-sha-\_ **noqa**. Appropriate: (Arí,) wayk'u-ru-ni-**n**.  
 Cook-Prog-(1subj) 1 pron (Yes), cook-Exh-1subj-AF  
 'I am cooking.' 'Yes, I have.'

This is a curious strategy because adults seldom produce explicit pronoun arguments, and they rarely produce utterances with extraposed subjects. In fact, according to Wölck (1987), the infrequent extraposition of the subject in a Quechua sentence occurs only when the subject is very insignificant.

Quite remarkably, during the next age range, 2;7 to 2;8, when Ana began producing the Affirmative suffix, the post-verbal pronoun strategy virtually disappeared from Ana's affirmative replies and assertions. The change observed is striking: the emergence of the Affirmative suffix in fourteen of the twenty-three responses to direct questions coincided with a marked decline in subject-final replies. Examples (12-14) are typical affirmative responses to direct questions in this age range, each exhibiting the Affirmative suffix. The utterance in (14) is an assertion produced by Ana in response to a WH-question. The responses in (13-14) reveal confusion regarding the appropriate allomorph, -mi following consonants and -n after vowels.

12. IL: Ati-ku-sha-n-chu?  
Can-Refl-Prog-3 subj-Interr  
'Can it be done?'
- Ana: Ati-ku-sha-n-**mi**, ati-ku-n-**mi**, ati-ku-n.  
Can-Refl-Prog-3-AF, can-Refl-3-AF, can-Refl-3  
'(Yes), it can be done, it can be done.'
13. IL: Qhelli-chu wawa ka-sha-n?  
Dirty-Interr baby be-Prog-3 subj  
'Is the baby dirty?'
- Ana: \*Qhelli-**mi**. (Qhelli-**n**)  
Dirty-AF  
'(Yes), dirty.'
14. IL: Pi-taq kay chukcha-ta ñaqch'a-ra-sunki?  
Who-Cont this hair-Acc comb-Past-3subj>2obj  
'And who combed your hair?'
- Ana: \*Mama-yki-**n-mi**. (Mama-yki-**n**)  
Mom-2 poss-AF-AF  
'Your mom.'

Table 2 presents a summary of Ana's affirmative answers during the first two age ranges. In the first, 2;5 to 2;6, Ana produced no instances of the Affirmative suffix, while nine, or 50%, of her replies showed the post-verbal pronoun subject strategy. In the next age range, 2;7 to 2;8, there are only two such replies (9%), with fourteen responses--nearly two thirds--exhibiting the Affirmative suffix. Another five of the twenty-three replies contained only verbs. This was appropriate insofar as the focused constituents in the questions preceding these five replies were also verbs; nevertheless, these answers lacked the Affirmative suffix.

Table 2: Ana's affirmative answers to direct questions in two age ranges

| Age Range ==>                                     | 2;5 - 2;6 |   | 2;7 - 2;8 |   |
|---|-----------|---|-----------|---|
| Answer Type*                                      | #         | EXAMPLE   | #         | EXAMPLE   |
| (C)-V-S   | 9         | IL: Atinki, riki.<br>'You can.'<br>Ana: Atin_ noqa.<br>'I can.'   | 2         | IL: Mikhunata<br>wayk'uranki-chu?<br>'Did you cook food?'<br>Ana: Mikhunata<br>wayk'usa_ noqa.<br>'I'll cook food.'       |
| (S) and/or (C)                                    | 3         | IL: Purinki-chu?<br>'Will you walk?'<br>Ana: Noqa.<br>'I.'  | 2         | IL: Aqha-chu chaypi?<br>'Is the chicha there?'<br>Ana: Ankay-__ aqha.<br>'The chicha's over there.'                       |
| Verb only   | 2         | IL: Ña-chu chayasqa?<br>'Is it already cooked?'<br>Ana: *Chayaskushan.<br>'?It is cooking.'               | 5         | IL: Purinki-chu?<br>'Will you walk?'<br>Ana: Purisaq.<br>'I'll walk.'   |
| (S), V, C   | 4         | IL: Manchakunki-chu?<br>'Are you afraid?'<br>Ana: Noqa machakusa_<br>kukulu_<br>'I'm afraid of the kuku.' | --        |   |
| Affirmative evidential on questioned constituent. | ---       |   | 14        | IL: Atikushan-chu?<br>'Can it be done?'<br>Ana: Atikushan- <b>mi</b> ,<br>atikun- <b>mi</b> ...<br>'Yes, it can be done.' |
| TOTAL:  | 18        |   | 23        |   |

\* S = Subject; V = Verb; C = Complement

During the third age range, 2;9 to 2;10, Ana produces no verb-subject responses at all. A further development in this age range is the first appearance of Affirmative-marked utterances which are not responses to direct questions. In these utterances, as shown in (15-16), the word-initial constituent invariably bears the Affirmative suffix; no elements are focused. By the age of 2;10, then, Ana has acquired productive use of the Affirmative suffix for affirmative replies to direct questions and for expressing assertion or conviction--the validational function.

15. \*Mikhu-ni - **mi** pampa-lla-pi (Mikhu-ni-n)  
Eat 1 subj AF floor Delim Loc  
'I eat just on the floor.'

16. Hap'i-sha-ni- **n** qan-paq-ta, mana Lubisa-\_\_\_-ta-qa.  
Hold Prog 1 subj AF 2 pron Ben Acc Neg Lubisa (Ben)Acc Top

'I'm holding the one for you (yours), not the one for Lubisa (Lubisa's).'

*Reduplication* At this point, I should mention that adult speakers of Quechua have other means of emphasizing sentence elements. Besides the morphosyntactic focus provided by the Affirmative suffix, Quechua speakers appear to rely on the reduplication of constituents. The duplicated constituents, including subjects, objects, adjuncts, and verbs, typically occur utterance-initially and -finally; that is, speakers appear to emphasize a sentence-initial element by repeating it at the very end. Examples of this strategy, both produced by Chalhuanacan adults, are presented in (17-18).

17. Uña-ta lliq chichi-rqu-nqa uña-ta. [Object]  
Lamb-Acc all hail-Exh-3 fut lamb-Acc  
'It will hail on all the lambs.'
18. Chay huq gringa-chu chay huq? [Subject]  
That one gringa-Interr that one  
'Is that one another gringa?'

Although Ana does not yet focus sentence constituents morphologically by means of the Affirmative suffix, utterances from the earliest period reveal that the reduplication strategy is available to Ana for emphasizing different sentence elements. The examples in (19-22) were all produced during the first age range, 2;5 to 2;6. In fact, all the children made use of the reduplicating strategy for emphasizing sentence constituents.

19. Sara-ta mama-y apa-ku-sha-n sara-ta. [Direct Object]  
Corn-Acc mom-1 poss take-Refl-Prog-3 subj corn-Acc  
'My mom is taking the corn.'
20. Wawa-ta puri-sha-ni wawa-ta. [Directional Complement]  
Baby-Acc walk-Prog-1 subj baby-Acc  
'I'm walking to the baby.'
21. Pasa-n calli-pi pasa-n. [Verb]  
Go-3 subj street-Loc go-3 subj  
'He goes in the street.'
22. Noqa wasi-ta puri-yku-sa\_ noqa. [Subject]  
1 pron house-Acc walk-Aug-1 fut 1 pron  
'I will walk to the house.'

*Hilda* The following set of utterances (23-26) was produced by the next child, Hilda, ages 2;10 to 3;1. In contrast to Ana, Hilda is beginning to make use of the Affirmative suffix as a focus-marker. As shown in (25-26), Hilda produces assertions with and without focusing. In (26), for example, it is the verb qo- 'give' that bears the primary focus of the sentence. Like Ana, Hilda occasionally appends the wrong allomorph to words ending in vowels, even at age 3;1. This is shown in (24).

23. IL: Gusta-sunki-chu?  
Like 3 subj->2 obj Interr  
'Do you like it?'
- Hilda [2;11]: Gusta-sha-wa-n- **mi**.  
Like Prog 1 obj 3 subj AF  
'Yes, I like it.'
24. IL: Mana-chu kunan señorita-yki suya-sunki?  
Neg Interr now señorita 2 poss wait 3 subj ->2 obj  
'Won't your señorita wait for you now?'
- Hilda [3;1]: \*Suya-wa-n-ku- **mi**. (Suya-wa-n-ku- **n**)  
Wait 1 obj 3 subj pl AF  
'Yes, they'll wait for me.'
25. Qhepa-pi- **n** runa puri-nqa.  
Back Loc AF man walk 3 fut  
'The man will walk later (?).'
26. Platu-ta noqa-man qo-wa-rqa-n- **mi**.  
Plate Acc 1 pron Dat give 1 obj Past 3 subj AF  
'She gave the plate to me.'

*Juan* We now turn to the oldest child, Juan, ages 3;0 to 3;2. The data I will present are taken from conversations between Juan and family members. The conversations centered on family photographs, with different members of the family quizzing Juan about their contents. In this conversational context, Juan used the Dubitative suffix, -cha, in conjectures or expressions of uncertainty. Examples (27-29) show the use of this suffix, with and without focusing. In each example, Juan speculates about aspects of the photographs that he cannot actually see or discern.

27. IL: Ima-ni-n doctor?  
What-say-3 subj doctor  
'What does the doctor say?'

- Juan:           **Mana- *cha*** kusi-ku-n-chu.  
Neg-DU (be)happy-Refl-3 subj-Interr  
'Maybe he isn't happy.'
28.   IL:           Ima chay?  
What that  
'What's that?'
- Juan:           Ima- ***cha*** chay-qa?  
What-DU that-Top  
'What could that be?'
29.   IL:           Ima-ta ruwa-sha-n?  
What-Acc do-Prog-3 subj  
'What is he doing?'
- Juan:           Ima-ta-pis ruwa-n-chu qaqa-pata-pi- ***cha***?  
Something-Acc do-3 subj-Interr cliff-top-Loc-DU  
'Could he be doing something on top of the cliff?'

I present these examples as a contrast to Juan's use of the Affirmative suffix during the same conversations. Juan uses the Affirmative suffix in convictions based on direct photographic evidence: he uses the suffix to make assertions about clearly revealed aspects of the photographs that he can actually see for himself. This is the evidential function of the Affirmative suffix. Sample utterances, with and without focusing, are provided in (30-32).

30.   IL:           Chay-pi ima-taq ka-sha-n?  
That-Loc what-Cont be-Prog-3 subj  
'And what is over there?'
- Juan:           Qan-ta- ***n*** q'epi-sha-sunki.  
2 pron-Acc-AF carry-Prog-3 subj>2 obj  
'Someone is carrying you.'
31.   IL:           Pi-taq pay?  
Who-Cont 3 pron  
'And who is he?'
- Juan:           Chay-qa noqa- ***n*** ka-sha-ni.  
That-Top 1st pron-AF be-Prog-1 subj  
'That's ME!'

32. IL: Pay-ri?  
3 pron-Resp  
'And he?'
- Juan: Tiyu-y sapallan-**mi** ka-sha-n.  
Uncle-1 poss alone-AF be-Prog-3 subj  
'My uncle is ALONE.'

### Concluding remarks

In concluding this brief discussion, I must acknowledge the fact that the functions of the Quechua Affirmative suffix--asserting, focusing, and claiming direct evidence--are intertwined. I realize that they are difficult to tease apart. Nevertheless, my data suggest that children acquire the functions of this suffix gradually, in a piecemeal, additive fashion. In fact, my study, though preliminary, suggests the following acquisitional sequence:

- I. Absence of independent suffixes; non-adult affirmative responses to direct questions, such as post-verbal pronoun subjects; emphasis only through reduplication
- II. Affirmative responses with **-mi/-n**; emphasis only through reduplication
- III. Affirmative responses with **-mi/-n** + Assertions (*validation function*) without focusing; emphasis only through reduplication
- IV. Affirmative responses with **-mi/-n** + Assertions with/without *focusing*
- V. Affirmative responses with **-mi/-n** + Assertions with/without focusing + Direct Evidence (*evidential function*)

Before the emergence of any independent suffixes, children may well make use of non-adult strategies in their affirmative responses to direct questions, e.g., producing post-verbal pronoun subjects. We have also seen that an early acquisition for emphasizing sentence constituents is the reduplication strategy also available to adult speakers. The first use of the Affirmative suffix occurs in affirmative replies, the most basic asserting function, followed by assertions which are not affirmative responses to direct questions. Thereafter, children begin focusing non-initial sentence constituents by means of the Affirmative suffix. At the end of this learning process, children have figured out the evidential function of the Affirmative suffix: used contrastively with other evidential suffixes, it enables the Quechua speaker to express assertions based on direct or attested evidence.

### Notes

<sup>1</sup> Appreciation is extended to the Spencer Foundation and to Paul Bloom, recipient of the grant, for funding of the 1996 fieldwork undertaken for this study.

<sup>2</sup> The reader is referred to Willett (1988) for an interesting discussion of evidentiality across languages.

<sup>3</sup> Abbreviations used in interlinear glosses are presented in the Appendix.

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### Appendix

Terms for abbreviations used in interlinear glosses

|                      |                        |               |
|----------------------|------------------------|---------------|
| Independent suffixes | AF - Affirmative       | /-mi/ or /-n/ |
|                      | RE - Report            | /-s/          |
|                      | DU - Dubitative        | /-cha/        |
|                      | Interr - Interrogative | /-chu/        |
|                      | Top - Topic            | /-qa/         |
|                      | Cont - Contrastive     | /-taq/        |
|                      | Resp - Responsive      | /-ri/         |

|                  |                            |                                    |
|------------------|----------------------------|------------------------------------|
|                  | Delim - Delimitative       | /-lla-/                            |
|                  | Disc - Discontinuous       | /-ña/                              |
| Nominal Suffixes | Poss - Person-of-possessor | 1st: /-y/, 2nd: /-yki/, 3rd: /-n/  |
|                  | Acc - Accusative           | /-ta/                              |
|                  | Dat - Dative               | /-man/                             |
|                  | Ben - Benefactive          | /-paq/                             |
|                  | Loc - Locative             | /-pi/                              |
|                  | Gen - Genitive             | /-q/, /-pa/                        |
| Verbal Suffixes  | Subj - Person-of-subject   | 1st: /-ni/, 2nd: /-nki/, 3rd: /-n/ |
|                  | Obj - Person-of-object     | 1st: /-wa-/, 3rd>2nd: /-sunki/     |
|                  | Agt - Agentive             | /-q/                               |
|                  | Fut - Future               | 1st: /-saq/, 3rd: /-nqa/           |
|                  | Past                       | /-r(q)a-/                          |
|                  | Refl - Reflexive           | /-ku-/                             |
|                  | Prog - Progressive         | /-sha-/                            |
|                  | Exh - Exhortative          | /-r(q)u-/                          |
|                  | Aug - Augmentative         | /-y(k)u-/                          |
| Pronouns         | noqa                       | first person singular              |
|                  | qan                        | second person singular             |
|                  | pay                        | third person singular              |
|                  | pi                         | interrogative: who?                |
|                  | pi-pis                     | indefinite: someone                |
| Negation         | Neg - Negative             | mana                               |

## **A quantitative view of borrowing patterns in Malinche Mexicano**

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### **0. Introduction**

There are many contradictory images of Europeans coming to the so-called New World. On the one hand, there are the idealized notions of British colonists who fled religious persecution to find freedom in New England, traditionally accompanied by touching vignettes of noble pilgrims sharing tender moments around a thanksgiving table with docile Indians. On the other hand, the conquests of the Aztec and Inca empires by conquering Spaniards bring graphic pictures of military defeat, of exploitation on a massive scale, and of the introduction of deadly plagues that wiped out huge segments of the indigenous population. Indeed, the Spaniards encountered civilizations that were fully intact and far from “primitive”, whose armies had to be vanquished—by hook or by crook. The indigenous people who survived were brought under total political and cultural domination; their vast wealth and abundant natural resources were placed under the control of the victors. While the social and cultural consequences fill volumes of recorded history, consequences in other areas of human behavior, particularly language, continue to be felt. Now, half a millennium has gone by since the first contacts between European languages and those indigenous to the Americas.

In their work on genetic linguistics, Thomason & Kaufman (1988) state “...that the history of a language is a function of the history of its speakers, and not an independent phenomenon that can be studied without reference to the social context in which it is embedded” (4). Thus, conquest, colonization and the resultant subjugation of people is expected to have far-reaching consequences on the languages of the vanquished—the asymmetrical relationships among people and languages tend to cause one-sided effects. One of the most obvious is linguistic borrowing. Specialists in contact phenomena often note that it is the language of the dominant social group that prevails and typically becomes the source for borrowing by speakers of the indigenous, recipient language, whose influence recedes over time (cf., Thomason & Kaufman 1988:67). Therefore, while the conquerors were required to learn terms for items new to their culture and experience (e.g., flora and fauna not found in Europe), speakers of the indigenous varieties were under greater pressure to learn the language of their colonial masters. Subsequently, numerous loanwords were integrated into their original, native language(s). Moreover, extensive borrowing can occur in all sorts of contact situations, in the face of the maintenance of the ancestral language or during shift to the new, socially dominant one.

Reasons for borrowing fall into a number of categories (Field 1998), some based on emerging social conditions. For instance, speakers of the non-dominant language may borrow particular terms because of the cultural dominance of the donor language and to be associated with speakers of that language, e.g., to gain socially or economically from its prestige. Such lexical knowledge may reflect growing expertise in professional domains under the direct control of the dominant-language group. New terms may push out old ones in the normal course of everyday business, a process which resembles language-internal change (e.g., the competition of forms via derivation). Borrowing, then, may be for affect or convenience due to the increased currency of new terminology. If the community is well along in the process of shift, borrowings may serve to fill lexical gaps, for instance, when traditional forms are forgotten, sound old fashioned, or are associated with certain conservative elements. It may even become increasingly common for older speakers to use borrowed terms to facilitate understanding when speaking with younger

people who have a declining proficiency in the ancestral tongue. In addition, specific terms may be selected because only one language has the precise word, or because an individual is not equally familiar with the words of both languages and chooses the one most available (Grosjean 1982:311).

Consistent with historical approaches, the development of language contact phenomena of all sorts have been discussed according to social aspects of the contact situation and the often complex relationships among social groups. Consequently, factors most often cited are (a) the relative number of speakers of each variety, (b) the cultural and social dominance of one group of speakers, (c) the intensity and length of contact, (d) attitudes towards the languages, and so on (Thomason & Kaufman 1988). Other approaches attempt to trace particular phenomena to different acquisition/learning scenarios, e.g. native language acquisition, which raises questions of language shift and attrition, the long-term effects of societal bilingualism, convergence, and the like. Some also deal with the likely effects of second language acquisition, which, in turn, brings up the accessibility of the target language (e.g., the absence or presence of formal instruction), L1 transfer, and the development of individual interlanguages (ILs) and their influence on a speech community. In situations characterized by degrees of maintenance or shift, the order in which languages are acquired (i.e. simultaneous versus consecutive acquisition) may also affect their usage and how speakers mix them together or switch from one to another.

With this as a preliminary backdrop, this paper discusses borrowing patterns in the variety of Mexicano (Náhuatl) spoken in the fairly remote highlands of the Malintzin (Sp. Malinche) volcano of Central Mexico. Borrowing of various sorts from Spanish as a result of intense Spanish-Mexicano bilingualism has been so extensive that its lexicon and structure can no longer be traced to one and only one progenitor—Traditional Náhuatl. For example, it has borrowed words/morphemes of all types, including nearly the entire stock of Spanish prepositions along with their typical phrasal constructions. It also incorporates conjunctions of all kinds, even the complementizer *que*. Such changes have clearly contributed to the loss of native morphological strategies and facilitated drift towards analysis in the matrix system. Co-occurrence patterns within the NP have changed, as well, according to the Spanish model. Another factor contributing to the drift of Mexicano towards analysis is the integration of large numbers of Spanish content items, which provides semantically transparent, lexical alternatives to prior morphological strategies (via noun incorporation and other derivational morphology), typical of situations involving polysynthetic varieties in contact with other, more analytical ones (cf., Mithun:1984, 1989; Romaine 1989:376)

One of the specific issues treated here is its possible classification as a bilingual mixture (mixed language) and the light that it can shed on the processes leading to language change, mixing, and the emergence of new languages. In this respect, brief comparisons are made between Malinche Mexicano and two languages widely accepted as “true” mixed languages: *Media Lengua*, a Spanish-Quechua mix spoken in the highlands of Ecuador; and *Michif*, a peculiar mix of French and Cree spoken by the Métis people in the Canadian provinces of Manitoba and Saskatchewan and in North Dakota and Montana in the United States.

## 1. The problem of Malinche Mexicano: mixed or not

Hill & Hill (1986) describe the Malintzin region as an indigenous cultural island within the Spanish-speaking communities of Tlaxcala and Puebla, basing their description on various patterns of social organization. In some smaller villages, as many as 20% are Mexicano monolinguals at present, while over 90% report using it in the home (Francis 1998:21). Despite the fact that there is pressure to adopt Spanish throughout the region, the language has managed to perpetuate many of its traditional links to intimate/familial oral domains. Nevertheless, to describe speakers' self-assessments of current usage, Hill (1988) states that it is highly stigmatized by all community members, who contrast it with romanticized (idealized) notions of the past, when an authentic Náhuatl (*legítimo Mexicano*) was spoken. "To describe the hispanized usage of modern speakers of Mexicano (where up to sixty percent of the lexical items in running speech may be identifiable as Spanish, with only inflectional material identifying the utterance as 'Mexicano'), the Nahuatl verb 'neneloa' (to mix), or Spanish 'mezclado' (mixed) can be used. But the most common rhetoric is to describe the language as 'revuelto' (mixed up)" (85).

In the initial stages of contact, terms were borrowed en masse to represent concepts introduced by Spanish conquerors. The numerous loanwords encompassed entire semantic domains having to do with European social practices. They included whole word families/taxonomies referring to religious customs (according to the spread of Roman Catholicism), kinship terms and others associated with social relationships, political organization (e.g. governmental, military, and legal organization), occupational and agricultural nomenclatures (including European monetary principles, implementation and methods of farming, and so on), educational and other institutional terminology, spatial and temporal measurement, and many other cultural accoutrements (e.g., clothing standards in various official and unofficial areas of life). It is fairly normal in the literature to consider individual loans as mere additions to an already existing store and not as noteworthy or significant as lexical replacements. As a consequence, extensive borrowing is not always noted for its cultural and cognitive effects. Nevertheless, entire systems of thought—ways of representing emergent views of reality foreign to the indigenous culture, entered the everyday lives and language of the people. The wholesale integration of this type of loan may be an indication of mixing by addition.

Historical evidence indicates that Náhuatl resisted structural borrowings for nearly three centuries from the beginning of the 16th to the end of the 19th century. Nouns were practically the only borrowings at first and began appearing in various texts between 1540 and 1560. Generally speaking, larger numbers of Spanish verbs did not begin to occur until the late 17th century; borrowed adjectives are relatively sparse throughout the entire colonial period. The first so-called particles, the prepositions *de* "from" and *a* "to", occurred in 1738—more than two hundred years after the conquest of 1519. Proportions of borrowed items (in terms of types) are represented in Table 1 (from Field 1998), below, according to the dates of individual works and collections of documents in which they are first recorded, beginning with the work of Fray Alonso de Molina in an early Spanish-language grammar of Mexicano and an accompanying vocabulary, both published initially in 1571, and followed by a teaching text (dated 1611) written by Pedro de Arenas, which was designed for Spaniards living in or visiting Mexico. The two rows labeled Texts represent the additional collection of documents investigated by Karttunen & Lockhart (1976); Texts (pre-1650) include items from documents dated prior to that cutoff, and Texts (post-1650) are those dated 1650 and later:

**Table 1. Spanish content items (types).**

|                   | NOUNS      | VERBS     | ADJECTIVES | PARTICLES |
|-------------------|------------|-----------|------------|-----------|
| Molina (1571)     | 201        | 1         | 0          | 0         |
| Arenas (1611)     | 57         | 0         | 0          | 0         |
| Texts (pre-1650)  | 496        | 9         | 7          | 0         |
| Texts (post-1650) | <u>224</u> | <u>24</u> | <u>6</u>   | <u>10</u> |
| Totals in Texts   | 720        | 33        | 13         | 10        |

While borrowed function words came relatively late, they apparently came in numbers, coinciding with a number of significant social changes. By the end of the 18th and beginning of the 19th centuries (nearly 300 years after the first contact of languages), numerous borrowed function items (e.g. prepositions, conjoiners, etc.) began to appear. These occurrences came as Mexico began to pull away from the colonial yoke of Spain and a new national identity emerged that was not strictly associated with the indigenous language and culture.

Table 2, below, shows the distribution of Spanish-origin borrowings that occurred in a 23,272-word portion of the oral interviews contained in the corpus gathered by Kenneth and Jane Hill of the University of Arizona over a ten year period, beginning in 1974. Therefore, the corpus represents modern, spoken language, and not the literary forms often cited in traditional texts. For the purpose of the present discussion, it is most important to note the number of tokens (in parenthesis), i.e., the actual frequency of occurrence in the text. The number of tokens clearly shows that borrowed Spanish function words play a critical role in the spoken language.

**Table 2. Spanish loans in Modern Mexicano (number of tokens in parenthesis).**

|                                      |             |
|--------------------------------------|-------------|
| CONTENT ITEMS (N, V, ADJ, ADV):      | 767 (3,431) |
| FUNCTION WORDS (PREPOSITIONS, ETC.): | 46 (3,221)  |

It is immediately apparent that it is simply not sufficient to describe borrowing patterns solely in terms of types (actual borrowed forms), without respect to usage. Frequency is quite revealing; it is a sure indication of the significance of borrowed elements. For instance, one out of 7.2 words (or 13.82% of the total) is an independent Spanish function word. One of the most frequent words is the Spanish preposition *de* "of, from". And, the rather constant occurrence of Spanish-like prepositional phrases in the place of indigenous case affixes (e.g., locative) and other inflectional or derivational morphology also demonstrates that new, foreign-origin strategies have been adopted by Mexicano speakers, and not a mere list of lexical items. It is also very likely that such borrowing (which clearly exceeds garden-variety lexical borrowing) is an indication of language change at very deep levels of grammar. This is particularly evident when one

considers that form generally follows function: are Spanish prepositions borrowed before, after, or along with their phrasal constructions?

The following sample, from Field (1998:172-3), shows the frequent occurrence of Spanish function words. (Spanish elements are in roman type, and Mexicano in italics. Running Spanish and English translations are found beneath the text.)

- (1) poz *nīn* pueblōh de mexicanoh poz pocos, aun *miec* genteh  
 well this town of Mexicano well some even many people  
 Pues, en este pueblo de mexicano, pues, poca, aun mucha gente  
 "Well, in this Mexicano town, well, a few, even many

*tlaht-ōa-h* mexicanoh *huān miec* genteh *tlaht-ōa-h* en castellanoh...  
 speak-TRNS-PL Mexicano and many people speak-TRNS-PL en castellano...  
 habla mexicano y mucha gente habla en castellano...  
 speak Mexicano and many people speak in Spanish..."

*huān nīn* pueblōh porque cada pueblōh *mo-patla-tīh* *nīn*  
 and this town because every town REFL-change-T este  
 y este pueblo porque cada pueblo está cambiando este  
 "...and this town, because every town is changing this

para saludar para platicas...  
 in order to greet for conversations...  
 para saludar, para platicar...  
 to greet (each other), to talk (have conversations)... (S51)

During the first three centuries of colonization, an obvious social stratification existed according to ethnic and language status (i.e., European colonists and their descendants, or *criollos*, versus colonized "Indians"). The likely linguistic correlate was language maintenance. However, such cultural changes as (a) the spread of Spanish throughout Mexico and increased bilingualism during longer periods after the conquest, (b) the rapidly accelerating emergence of a people of mixed race (i.e., mestizos) and the mixing of Spanish and indigenous cultures (a process called *mestizaje*), also took place at an accelerated pace at the turn of the 19th century. Significant language mixing increased accordingly, bringing into question the widely held assumption that the changes evident in Modern Mexicano accumulated slowly and gradually, since contact began.

Regarding the nature of bilingual mixtures, Thomason (1997) states that "...linguistic material from each source language is adopted wholesale, without the kind of distortion that would occur in the absence of bilingualism" (6). This is evident in spoken Mexicano of the Malintzin region, as well; there is little phonological reanalysis of borrowed Spanish elements according to native (original) Mexicano phonological patterns. Spanish-origin loans tend to be pronounced as they are in Spanish (Hill & Hill 1986:198), which is a marked change from the extensive sorts of phonological reanalysis that took place in the earliest years of contact (see Karttunen & Lockhart 1976). Older loans have become relatively infrequent in the modern, spoken language, often being replaced by newer, nonnativized forms. At times, such nativized forms as *compālehtzīn* "co-father" and *compālehtzīn* "co-mother" (ritual kinship terms) occur alongside nonnativized forms *compadrito* and *comadrita*. Native Mexicano elements are pronounced as they were in its so-called classical progenitor, with phonemic contrasts among long and short vowels (e.g., *ō* versus *o* in *tōca* "to bury" and *toca* "to follow, pursue") (Hill & Hill 1986:62). Thus, the phonemic inventory of the modern language has expanded to include a number of

Spanish consonants (which appear only in Spanish borrowings)—reminiscent of the phonological characterizations of Michif (Bakker 1997:80ff).

Judging from the results, it seems apparent that the transmission of Classical Mexicano has been something other than according to a normal, genetic model—assuming that “normal” change that preserves genetic lineage is primarily language-internal. Whether or not one can classify Malinche Mexicano as a “true” mixed language or not may be simply definitional. The obvious question is “how mixed is mixed.”

## 2. Relexification: all or nothing?

According to Muysken (1981): “...relexification can be defined as the process of vocabulary substitution in which the only information adopted from the target language in the lexical entry is the phonological representation” (61). This definition resembles both those of borrowing, specifically regarding substitutions (Haugen 1950), and the sort of relexification associated with the emergence of creoles such as Haitian (Lefebvre 1986). It is remarkable that “...ALL [emphasis his] Quechua words, including all core vocabulary, have been replaced” (Muysken 1997:365). Thus, relexified elements include not only noun, verb, and adjective stems (which are encased in Quechua inflectional morphology), but also various classes of function words such as pronouns, determiners, and occasional coordinators and subordinators. The impressive list of relexified vocabulary items presented in Muysken (1997) suggests that relexification has reached close to 100%. This certainly draws the reader attention to the social and psychological circumstances that could create such a social and linguistic effect. However, only one adposition, *despwesitu* (from the Sp *despues* “after”) can be considered a relexification. Quechua case-marking morphology remains intact, which functions in semantically similar ways to adpositions. Apparently, Media Lengua preserves Quechua morphological strategies and resists the adoption and integration of Spanish prepositions. This is very unlike Malinche Mexicano, in which the entire list of Spanish adpositions have been imported as *additions* along with the Spanish construction (i.e., phrasal word order).

The following example, from Muysken (1981:66), will illustrate how Spanish lexical items are inserted into Quechua frames. (Spanish items are in roman type; Quechua in italics. Spanish and English translations are located beneath the text.)

- (2) miza despwesitu kaza - *mu* i - *naku* - ndu - *ga*, ahi - *bi* buda da - *naku* - *n*  
 miza k'ipa wasi - *mu* ri - *naku* - pi - *ga*, chi - *bi* buda ku - *naku* - *n*  
 Mass after house - to go - PL - SUB - TO there LOC feast give - PL - 3

yendo a la casa después de la Misa, ahí dan una boda  
 ‘going home after Mass, they then give a feast there’

Considering such thorough lexical replacement, however, one must ask whether substitutions are required to reach 100% to be called relexification? If that is the criterion, then all other mixed languages fail (Field in press). If one adjusts that figure at all, then there must be some sort of reason to do so. Otherwise, it appears to be arbitrary. Bakker and Mous (1994) state:

As for the proportion, one can see that extreme borrowing never exceeds roughly 45% of the lexicon, whereas in some of the mixed languages discussed the proportion of ‘foreign’ lexical elements is closer to or over 90%, and this figure is the same whether one counts types or tokens. There do not seem to be languages

with a proportion of borrowed items between 45% and 90%, so that there is not continuum between languages with heavy borrowing and mixed languages. This suggests that the mixed languages are different from extreme cases of lexical borrowing. (5)

If one the claim that relexification is a process that can result in a mixed language, and that relexification must reach, say, 90% to be qualitatively different from extreme borrowing, then something must occur that differs from the substitution of vocabulary items. Perhaps a threshold of some kind is reached, past which there are no longer any restraints to lexical replacement. However, there must be additional factors that could explain such an occurrence (e.g., the emergence of an “in-between” ethnic or social status or language planning, whether conscious or not). The claim that there are no examples of languages with borrowings between 45 and 90% presume much, for example, that there has been a sufficient number of cases to validate such a generalization. This is, however, not entirely clear. Van Rheedem (in press) has found evidence of a Dutch-Malay mix, *Sturtjestaal*, which reaches around 70% Dutch elements in a Malay matrix affecting core vocabulary to a great extent, though not totally.

In Malinche Mexicano, one notable semantic domain in which substitutions are found in abundance is in kinship terms. The entire system has been adopted by Mexicano speakers. Other core vocabulary items have been borrowed as well, but clearly not to the extent that such words have been adopted by *Media Lengua*. However, regarding borrowing possibilities, the integration of other types of loans (besides substitutions) may be indications of mixing by addition. Borrowing of deeper sorts suggests a much greater knowledge of the donor system and indicates that original language forms and strategies are changing as a result of contact, being augmented and perhaps replaced. Such change may be the result of significant tension between language maintenance in the face of attrition—the gradual “death” of an original, native language, and shift to a new, heretofore foreign language, whose usage presents tangible social, cultural, and/or economic rewards.

### 3. Intertwining and underlying social conditions

The other mixed language/bilingual mixture mentioned in the introduction is Michif, which is said to have arisen as a result of language intertwining. Michif’s unique blend is not like *Media Lengua* (lexicon of one language embedded in the grammatical matrix of another). Its unique split is between the noun phrase, which is almost completely of French origin, and the verb phrase, which is almost entirely Plains Cree. The term implies that equal parts of two systems have become entwined to form one (and only one) system, with no clear donor/recipient asymmetry, no evidence of an order or sequence of acquisition, and no obvious dominance of one over the other. The following examples come from Bakker (1997); (3) illustrates the basic character of the Michif noun phrase, and (4) the Michif verb phrase (French elements are in roman type, Cree in italics):

- (3) mū            pči garsu sū            pči žwal  
 POSS.1S. little boy POSS.3SG. little horse  
 (lit., my little boy his little horse)  
 “my son’s pony” (88)
- (4) *bakwat-a:w-ak* lɪ *mu:d* *ka:-kɪmutɪ-čɪl*  
 1.hate-TA.3-PL DAMS people COMP-steal-3p  
 ‘I hate people who steal.’ (94)

Various hypotheses have been put forth to account for this odd split, two that are particularly relevant. The first, the New nation/mixed identity hypothesis, states that the Métis emerged as a new ethnic group with in-between status (half Cree, half French), and a new language emerged to express this identity. The second, the Code-mixing hypothesis, states that it arose as a result of community-wide code-switching/mixing that crystallized as an independent language, a mixture that can only emerge in such an intensely bilingual environment. Language-specific discourse patterns featured code-switched French noun phrases which were embedded within the Cree verb phrase. Lipski (1999) interprets this to mean that “despite the inserted French NPs, to all appearances Michif has a modified form of Cree as a matrix language” (585). Nevertheless, this is still very much removed from the obvious Quechua matrix of *Media Lengua*.

Mixed social or ethnic identity and code-mixing may interact. In that respect, a number of family types have been identified in the literature on bilingualism. Each one portrays the social and consequent psychological situation that can come into play. Many parents take steps to separate languages and the child’s exposure to them because young bilingual children appear prone to mixing behaviors. On the one hand, parents may alternate environments, using one language at home and the other elsewhere (at work, school, and so on). This, in turn, may lead to forms of diglossia and the eventual compartmentalization of languages—also affecting the long-term outcome of acquisition. On the other hand, one may parent speak one language, and the second parent the other (one person, one language). If one parent spends more time with the child (e.g., the mother), this may also influence the order of acquisition to some extent and the establishment of a linguistically dominant language (Cutler 1989, 1994). There is the hint that this may be the case in Michif.

Another possibility (which occurs in the Mexicano social context, as well) is a home environment in which languages are mixed. That is, both parents are fluent bilinguals; large parts of the community are bilingual; both parents code-switch and frequently use borrowed forms in one or both languages. For instance, both mother and father may engage in conversational code-switching in an social environment where family members, friends and acquaintances, and others also constantly code-switch. As a consequence, the input from the community does little to help the child keep languages separate. There is considerable controversy about whether, in the bilingual mind, there is one system or two (cf., Hoffmann 1991). This situation, however, is unique to only very specific types of bilingual individuals, and is certainly not something generalizable across all bilingual communities.

This acquisition scenario suggests the following, which is neither borrowing in a strict sense nor code-switching of any kind: (1) a child may unconsciously assume that his/her input belongs to one language system as demonstrated by usage in the community, and interprets all data as evidence of a single (fused) system; (2) the child constructs a system for production—via an on-line synthesis of sorts—that contains elements from two discrete language systems; and (3), within a community that accepts such mixing behaviors as normal (or as a social marker), a variety may emerge that is truly a bilingual mixture, a consequence of profound contact. Such a mixed language, therefore, undoubtedly involves deep borrowings (lexical and structural) as a result of contact, but also involves the blending of systems where no clear matrix is found; viz., there is no clear native/non-native distinction, no unequivocal evidence of a sequence of acquisition (i.e. L1, L2), and no obvious dominance of one over the other. Such may be one explanation for the emergence of mixed languages such as Michif and others currently under investigation.

#### 4. Conclusions

Is relexification all or nothing? Is it a type of borrowing? Or, is the reverse a possibility, that borrowing is a type of relexification? Is relexification also part or sub-process of language intertwining? The replacement of an indigenous, original language lexicon obviously indicates the mixing or blending of languages and cultures. However, Michif does not show such total relexification; its mixed characteristics are striking, nonetheless. What sort of parameters can be placed on intertwining that can accurately capture the nature of Michif, and yet allow for the inclusion of Media Lengua (and other relexified languages) in a classification called mixed languages/bilingual mixtures? The answers to these questions seem to lie in a definition of mixed language that is capable of including both. It must be general enough to describe all cases of mixed language (already discovered and yet to be identified), and specific enough to not be completely vacuous. Perhaps a list of characteristics can be assembled that are typically associated with mixed languages (e.g., lexical replacement, intertwined systems, etc.). For a language to be considered truly mixed, it may possess these characteristics in different numbers and strengths (Field, forthcoming). In that way, Michif, which is not totally relexified (but consists of an intertwined system that originated from two progenitors), and Media Lengua, which is relexified (but whose grammatical system is intertwined to a lesser extent than Michif), can both be included.

The presence of a literature tracing the historical development of any variety of Mexicano from its presumed classical ancestor (or hypothetical *legítimo mexicano* of their ancestors) to its current state certainly does not prohibit the unbiased, synchronic assessment of its character at a particular point in time. Whether it has emerged rather suddenly or over longer periods of time (the diachronic) as a consequence of the social, economic, and consequent linguistic subjugation that typically accompanies colonization should not matter, either. Ma'a, another bilingual mixture of note, arose as a result of "long-term linguistic persistence in the face of intense cultural pressure from Bantu..." (Thomason 1997:6). In that Malinche Mexicano has taken on so many characteristics of Spanish (beyond the phonologically adapted lexical borrowing typical of the first three centuries of contact), it may be considered a mixture of sorts. However, the question still remains: how mixed is mixed?

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# Chickasaw Intonation: A Descriptive Study

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## 0. Background

This paper provides a description of the intonational structure of Chickasaw, a Western Muskogean language currently spoken in south-central Oklahoma by no more than a few hundred speakers. The Chickasaw originally lived in the southeastern United States but were one of the “Five Civilized Tribes” (along with Choctaw, Creek, Seminole, and Cherokee) forcibly moved during the 1830s into what is presently the state of Oklahoma. Chickasaw’s closest linguistic relative is Choctaw, which together with Chickasaw, forms the Western branch of Muskogean.

The bulk of the linguistic research on Chickasaw has been carried out by Pamela Munro (and colleagues), much of it in conjunction with Catherine Willmond, a native speaker of Chickasaw. Munro and Willmond (1994) is a Chickasaw-English and English-Chickasaw dictionary which contains an extensive grammatical introduction. Munro (in press) provides a summary of the principal grammatical features of Chickasaw. Munro (1999) is a pedagogical grammar. On the phonetics/phonology side, Munro and Ulrich (1984) provides a description and analysis of the Chickasaw phenomenon of rhythmic lengthening (see section 2.1 of this paper), while Munro (1996) is an unpublished manuscript containing a thorough qualitative description of Chickasaw phonetics and phonology. Gordon et al. (1997) is a quantitative study of many aspects of Chickasaw phonetics. Munro et al. (in progress) provides a thorough discussion of phonetic and phonological aspects of Chickasaw vowel duration. Gordon (1999) and Gordon (in progress) discuss phonetic and phonological aspects of Chickasaw intonation, the focus of this work.

## 1. Introduction to Chickasaw intonation

The present study of Chickasaw intonation is primarily a descriptive work, although it will employ a certain amount of formalism to make the descriptions more explicit. The model of intonation used here is a simplified version of the Tone and Break Indices (ToBI) model of intonation originally developed for English (Silverman et al. 1992, Beckman and Hirschberg 1994, Pitrelli et al. 1994) and subsequently extended to Japanese (Venditti 1995, Campbell and Venditti 1995), Korean (Jun 1999), and other languages. This model assumes a series of high and low tones (abbreviated H and L, respectively) which are aligned with either intonational boundaries, syllables, or units of timing, such as moras. The phonetic pitch contour is the result of pitch interpolation between the phonological tones. Thus, for example, if we assume a string of three syllables in which the first syllable carries a high tone and the third syllable a low tone, the second syllable in that string will contain falling pitch.

Following the ToBI model, and many other models on intonation, it will also be assumed here (see section 4 for discussion) that an utterance can be broken down into smaller intonational units which can be defined in tonal terms. The principal ones which will come into play in the present study are the Intonational Phrase (abbreviated IP), which is characterized by a boundary tone at its right edge and at least one nuclear pitch accented

syllable which carries higher tone than other syllables, and the Accentual Phrase (abbreviated AP), which is smaller than the Intonational Phrase and consists of its own tonal melody.

## 2. An overview of Chickasaw prosody

Chickasaw has a relatively complex prosodic system combining aspects of a stress system with those of a lexical pitch accent system. In addition, a process of rhythmic vowel lengthening adds an additional layer of durational prominence. Sections 2.1-2.4 provide a brief description of Chickasaw prosody and basic word order facts.

### 2.1. Rhythmic lengthening

One of the more salient characteristics of Chickasaw prosody is its pattern of rhythmic lengthening whereby the second (if non-final in a word) in a sequence of two vowels in adjacent open syllables is phonetically lengthened (see the works in section 0 for further discussion). Thus, for example, the underlying string /**pisalitok**/ 'I looked at it' is realized phonetically as [**pisa**'litok], where the rhythmically lengthened [a'] is indicated by a half-length IPA symbol. Rhythmic lengthening is bounded by the word and does not affect word-final vowels; thus, the word /**pisa**/ 'she looked at it' is realized simply as [**pisa**] without lengthening of the final vowel. Certain prefixes and suffixes belonging to the morphological word fall outside the domain of rhythmic lengthening. For example, in the word /**im-apilali**/ 'I help him for her' the dative prefix **im-** falls outside of the rhythmic lengthening domain which initiates with the second syllable; the result is lengthening of the third and not the second vowel, i.e. [**imapi**'lali]. There are certain other complications regarding rhythmic lengthening which will not concern us here (see the aforementioned works for discussion). Nor will we concern ourselves with the question of whether rhythmically lengthened vowels are durationally neutralized with phonemic long (see Gordon et al. 1997 and Munro et al. to appear for discussion and phonetic data).

A basic understanding of rhythmic lengthening is necessary in discussing Chickasaw intonation, since the lengthened vowels behave identically to phonemic long vowels for purposes of nuclear pitch accent placement. Rhythmically lengthened vowels also behave parallel to phonemic long vowels with respect to other prosodic and morphological phenomena in Chickasaw (see Munro and Willmond 1994 for details).

### 2.2. Stress

The issue of stress in Chickasaw is rather subtle and has not been discussed much in previous works. Munro (1996) observes that the final syllable of a word characteristically sounds most prominent, but that syllables containing long vowels (including phonemic long vowels, rhythmically lengthened ones, and nasalized vowels, which are phonetically long) and closed syllables appear to be more prominent than non-final open syllables containing short vowels. These observations will be shown to accord with the observations about Chickasaw intonation made later in this paper. In particular, final syllables in statements attract the nuclear pitch accent (section 5.2) and long vowels and closed syllables attract the nuclear pitch accent away from open syllables with short vowels in questions.

In addition to the prominence distinction between final and non-final syllables and between heavy (i.e. long-voweled and closed syllables) and light syllables, it is useful to make a further distinction between syllables containing a long vowel and closed syllables containing

a short vowel. Syllables containing a long vowel (including phonemic long vowels, nasalized vowels, and rhythmically lengthened ones) appear to have greater potential to carry prominence than closed syllables containing a short vowel. This greater potential for prominence manifests itself in phrase-medial words, where the greatest amplitude and highest pitch characteristically fall on the rightmost long vowel in a word. In words without long vowels, it is more difficult to pinpoint the location of stress; rather the tonal properties of the accentual phrase (see below) appear to be the most salient prosodic characteristics of such words. As pointed out by Munro, however, closed syllables and long vowels (including ones not assumed here to carry primary stress) do seem to be more prominent than open syllables containing a short vowel, though this prominence is generally not associated with higher pitch and only inconsistently associated with greater amplitude.

### 2.3. Morpholexical pitch accents

Certain Chickasaw words inherently possess a certain syllable which carries a pitch accent, phonetically realized as a pitch peak. Words containing one of these “morpholexical” pitch accented syllables, termed “grades” in the Muskogeanist literature, are usually semantically related to a base form without a pitch accent. These grade, or pitch accented, forms are limited to verbs and convey aspectual information, though the exact semantic link between the base and a pitch accented forms is often difficult to pinpoint. An example of a morpholexical pitch accent is provided by the word *hík:ija* ‘to be standing’ with a pitch accent on the initial syllable (marked by a circumflex accent in this example and others later to differentiate it from the phonologically conditioned nuclear pitch accent) is related to the word *hika* ‘to stand up’ which does not have a pitch accent. Typically the penultimate syllable of the pitch accented root is the syllable which carries the pitch accent, though in some cases, the antepenultimate or even the preantepenultimate syllable of the root can carry the pitch accent (Munro and Willmond 1994). There are several classes of pitch accented words which can be grouped according to the prosodic relationship between the base word and the pitch accented derivative. The location of the pitch accent is predictable assuming certain sets of often complex alternations between the base and the pitch accented word (see Munro and Willmond 1994 for detailed discussion).

The morpholexical pitch accents described in this section are relevant to a discussion of intonation, since they interact with the phonologically predictable nuclear pitch accent found in an intonation phrase-final word (see section 5.3).

### 2.4. Prosody and word order

The dominant sentential word order in Chickasaw is Subject-Object-Verb (Munro and Willmond 1994, Munro to appear), though other word orders may arise under certain pragmatic and/or semantic conditions which are not well understood. These less common word orders are associated with intonation patterns not found in sentences characterized by the more typical SOV order (see section 5.1.1).

## 3. Methodology of the current study

The bulk of the data presented here is based on a corpus of speech uttered by four native speakers of Chickasaw (3 female, 1 male), three of whom (2 female, 1 male) were recorded during a trip to Oklahoma in September 1996. The fourth speaker was recorded in Los Angeles in October 1996. On subsequent occasions, this last speaker also provided

additional data not collected from the other three consultants. In addition, small amounts of data were recorded from two other speakers in Los Angeles, one of whom had been recorded in Oklahoma reading different material. Data from six speakers (of whom four provided the majority of the data) was digitized and analyzed using X-Waves and PcQuirer software. Material from a further seven speakers was considered impressionistically but not instrumentally analyzed.

During each recording session in Oklahoma, which involved a single Chickasaw speaker, the subject was read an English sentence and asked to supply the Chickasaw equivalent. The data set consisted of a number of sentences designed to investigate major intonational features of Chickasaw. The bulk of the data consisted of two word sentences consisting of a noun (either a subject or a direct object) followed by a verb. The number of syllables of both the noun and the verb, as well as the internal syllable structure of the noun were varied systematically in the corpus. In addition, sentences with both a subject and an object were examined, as were sentences containing a possessive construction (e.g. 'X's dog'). The corpus also consisted of some questions, exclamations, negated sentences, and sentences containing focused noun phrases. A total of approximately 100 different sentences were uttered by each speaker. Each sentence was repeated three times. The sentences in Table 1 illustrate the kinds of sentences elicited. (Note that the half-long symbol indicates a rhythmically lengthened vowel; see section 2.1.) In addition to the 100 sentences recorded in Oklahoma, another speaker recorded a large number of additional sentences in Los Angeles over the next approximately three years.

Table 1. Examples of the sentences recorded

| Structure       | Chickasaw  | English gloss               |
|-----------------|--|-----------------------------|
| subject-verb    | <b>minka:t pisa.</b><br>chief(subj) sees           | The chief looks at her/him. |
|                 | <b>minka:t pisa'tok.</b><br>chief(subj) sees(past) | The chief looked at her/him |
|                 | <b>ofō:loat pisa.</b><br>owl(subj) sees            | The owl looks at her/him.   |
| object-verb     | <b>minko? pisa.</b><br>chief(obj) sees             | She/he looks at the chief.  |
|                 | <b>minko? pisa'tok.</b><br>chief(obj) sees(past)   | She/he looked at the chief  |
|                 | <b>ofō:lo pisa.</b><br>owl(obj) sees               | She/he looks at the owl.    |
| subj.-obj.-verb | <b>minka:t ofō:lo pisa.</b>                        | The chief looks at the owl. |

#### 4. Hierarchical intonational structure

A Chickasaw sentence typically consists of a single Intonational Phrase (IP) which in turn is composed of one or more intonational units, which may be termed Accentual Phrases (AP), each of which is canonically made up of the tonal melody [LHHL] (for more discussion, see section 5.4). An IP has one or more nuclear pitch accents which are characteristically realized in the last word of the IP, or over the last two words in the case of biverbal IPs. An IP ends in

a boundary tone which is associated with the phonetically highest or lowest pitch (depending on the type of boundary tone) in the IP.

An exception to the generalization that a sentence consists of a single IP is provided by sentences in which the canonical Chickasaw SOV word order is substituted with an order in which the verb does not appear in sentence final position. In such utterances, the verb is in IP-final position and any postposed noun phrases form a separate IP (see section 5.1.1).

**5. The tones**

**5.1. Boundary tones**

An IP ends in a boundary tone (indicated by a % following a tone or a sequence of tones), a H% in the case of statements and a L% in Wh and yes/no questions and also in IPs characterized by the surprise contour. The high boundary tone in statements is presumably responsible for the impression that final syllables are stressed in the default case in Chickasaw (Munro 1996). Phonetically, the high boundary tone in statement IPs is upstepped relative to any other highs in the IP. Interestingly, two of the four speakers (1 male and 1 female) upon which the analysis is predominantly based often end their statements in a slight pitch fall in the final syllable following the H% pitch peak which also occurs in the final syllable. This pitch fall is often imperceptible and, in many cases, can be regarded as a by-product of non-modal phonation associated with utterance final position. However, in other tokens, the fall commences relatively early in the final syllable and is quite perceptible, suggesting that a HL% boundary tone should be included in the inventory of Chickasaw boundary tones alongside the H% and the L% boundary tones. The pitch nadir associated with the HL% boundary tone in statements is phonetically not as low as the L% boundary tone characteristic of questions. Interestingly, a third speaker employs the slight IP final fall, but almost exclusively in imperatives and emphatic conditions.

Given its predominance, I will assume that the primary boundary tone in statement IPs is H%, with a complex HL% being an option for some speakers, though the semantic circumstances which give rise to this complex boundary tone are not completely understood. The canonical IP-final H% boundary tone in statements is illustrated in Figure 1. Figure 2 illustrates the HL% boundary tone in statements.

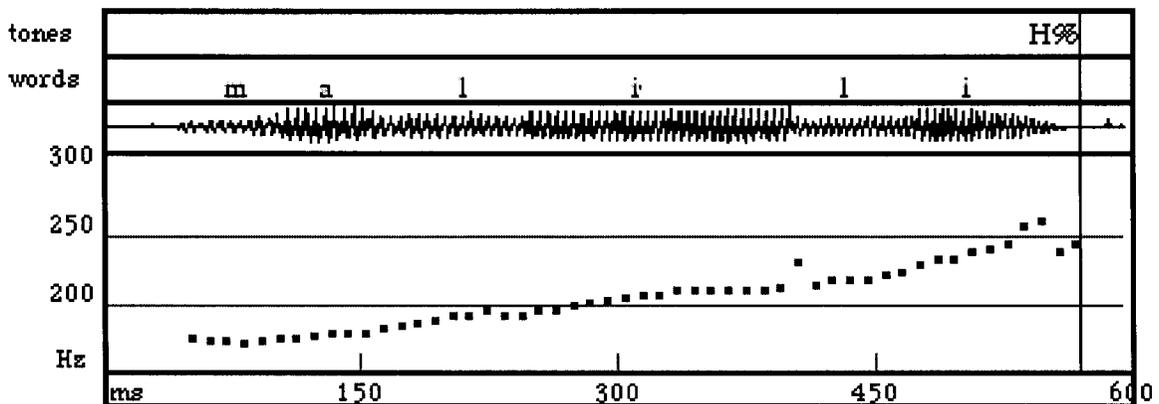


Figure 1. Final H% boundary tone in statement IP mali'li 'She/he runs.'

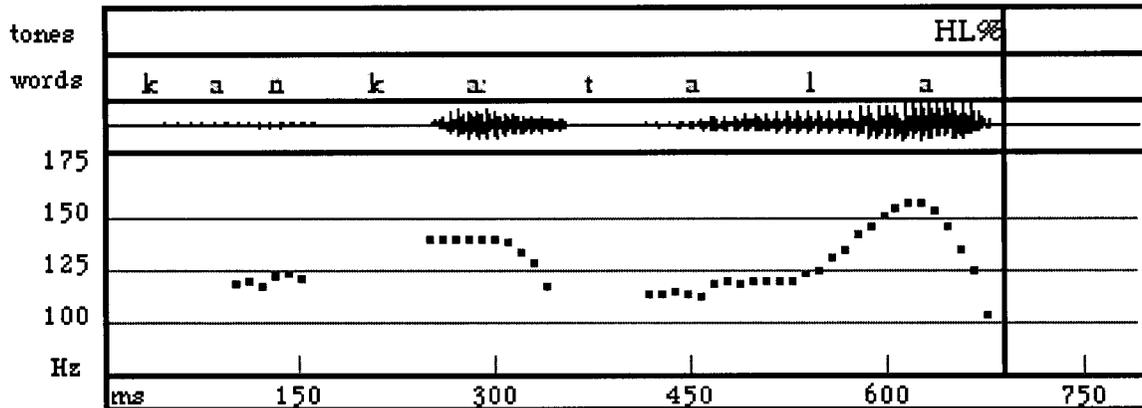


Figure 2. Final HL% boundary tone in statement IP **kankat ala** 'The skunk is here.'

Wh and yes/no questions end in a long pitch fall commencing immediately after the nuclear pitch accent (see section 5.2) and persisting through the end of the IP. The lowest pitch in a question is found at the end of IP, suggesting a L% boundary tone. It is also employed in exclamations expressing surprise or disbelief. A question IP L% boundary tone is illustrated in Figure 3, while Figure 4 illustrates the L% boundary tone characteristic of surprise intonation.

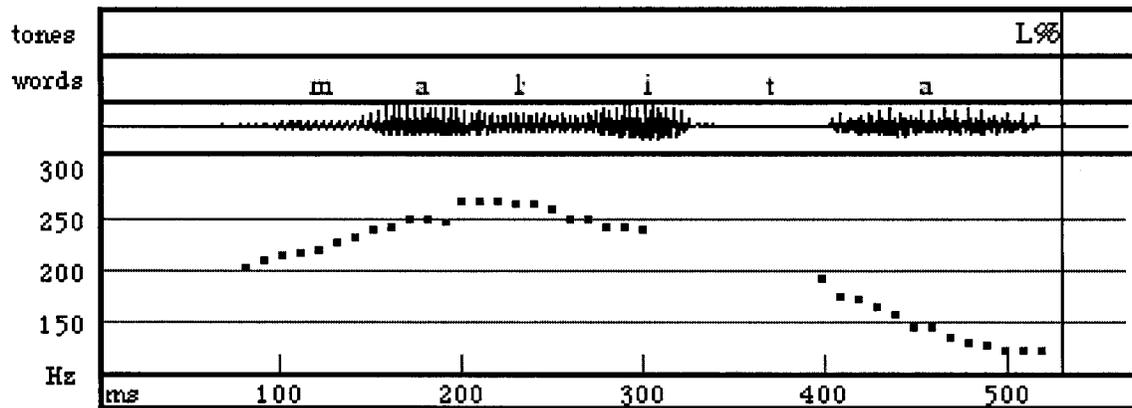


Figure 3. Final L% boundary tone in question IP **mal:ita** 'Is she/he jumping?'

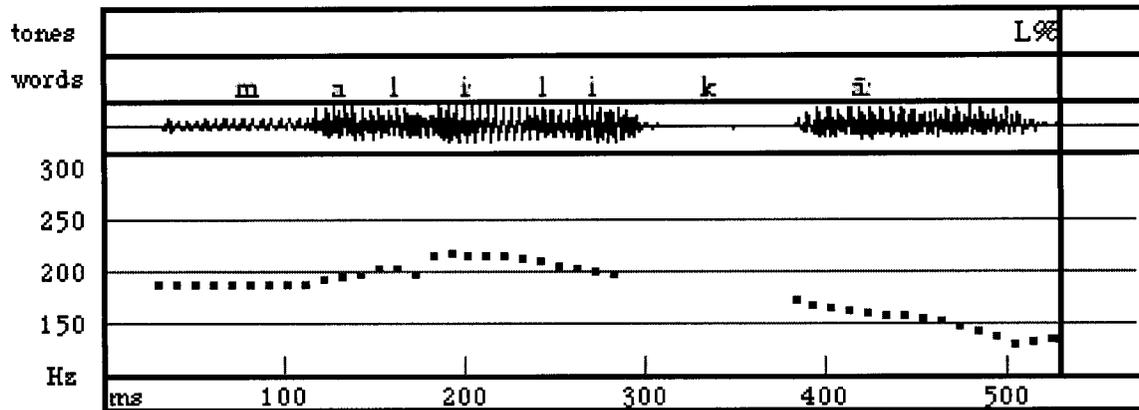


Figure 4. Final L% boundary tone in exclamation IP *mali'likā*: 'She/he is running!'

### 5.1.1. Word order and boundary tones

Postposed noun phrases following a verb in IP-final position form an independent IP characterized by different intonational properties than the preceding IP. Thus, for example, in the utterance *pisa ofō:loat* looks owl(subj) 'The owl looks at her', the verb and the postposed subject each form an IP. The first IP is realized with a H% (or HL%) final boundary tone, as the description thus far would predict. The pitch range of the second IP consisting of the postposed noun, however, is reduced relative to that of the preceding IP. A high tone in the second IP is phonetically equivalent to a low tone in the first IP. Furthermore, an IP consisting of a postposed noun phrase culminates in a final L% boundary tone even in statements. The intonation associated with a postverbal noun is illustrated in Figure 5.

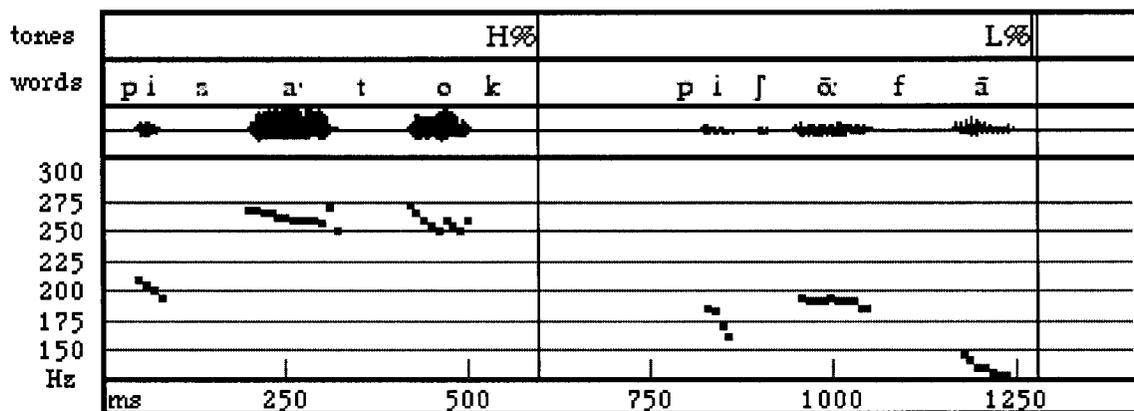


Figure 5. Object-verb sentence *pisa'tok pifō:fā* 'She/he looked as the pishofa (type of food).' consisting of two IPs.

## 5.2. Nuclear Pitch Accent

An IP contains at least one (but under certain circumstances, two; see below) syllable, the nuclear pitch accented one, which stands out from others by virtue of possessing the highest pitch and greatest amplitude in the IP. The nuclear pitch accent (indicated by an asterisk) is H\* in both questions and statements; it is phonetically most transparent, however, in question IPs where the final boundary tone is L%. The point at which the pitch fall to the final low boundary tone in questions originates is the syllable carrying the nuclear pitch accent. This syllable also has the greatest amplitude in the IP. Figures 6 and 7 exemplify nuclear pitch accent placement in question IPs (nuclear pitch accents marked by an acute accent). The large pitch excursion involved in the transition from H\* nuclear pitch accent to L% boundary tone in questions, in combination with a series of morphological factors, introduces a number of complications into the algorithm for determining the location of the nuclear pitch accent in questions (see below).

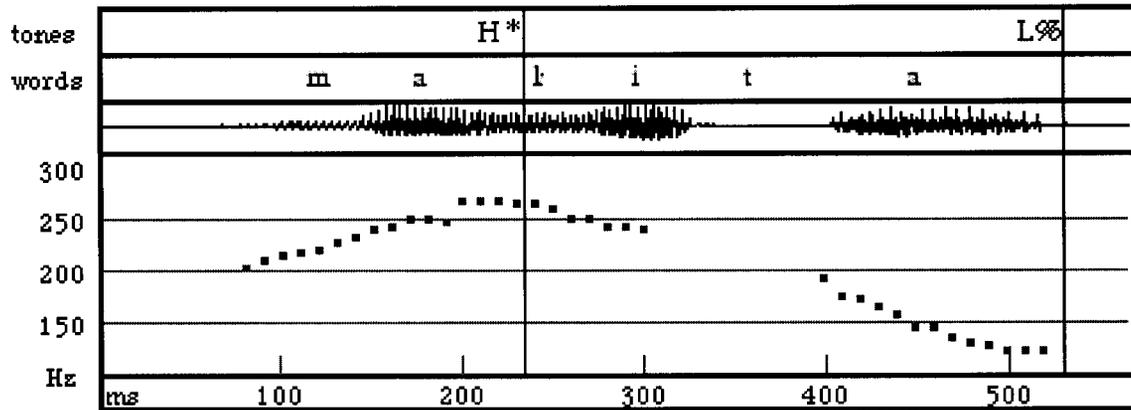


Figure 6. Nuclear pitch accent in question IP *má:lita* 'Is she/he jumping?'

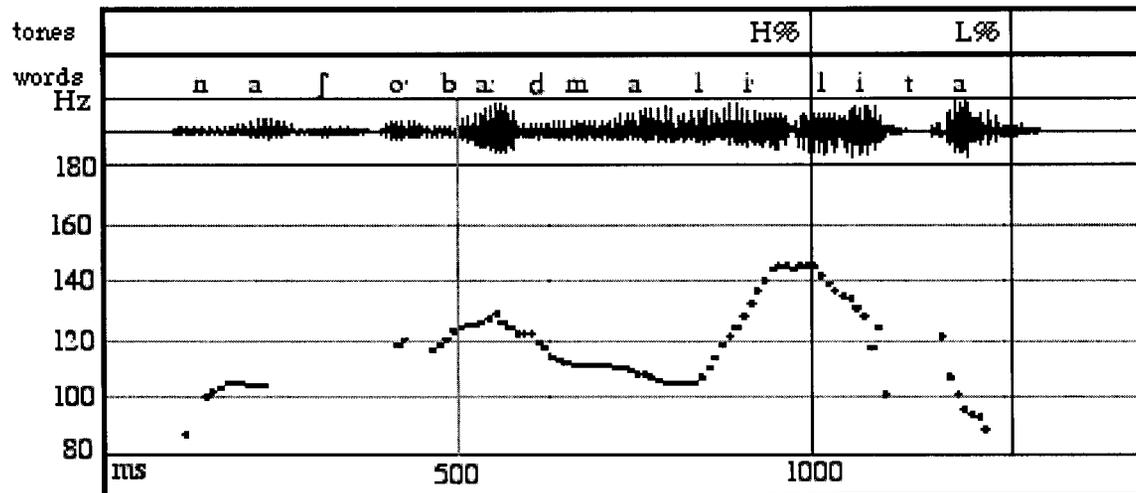


Figure 7. Nuclear pitch accent in question IP *naʃo'bat má:lita* 'Is the wolf running?'

In statements, the phonetic evidence for the nuclear pitch accent, which is H\* as in questions, is less robust due to the final H% which independently raises the pitch of the final syllable. However, in the absence of any evidence to the contrary, we may assume that, regardless of syllable weight and morphological factors, the final syllable receives the nuclear pitch accent in statements. In support of this analysis, the final syllable also characteristically carries not only the highest pitch but also the greatest amplitude in a statement IP, although a long vowel (including rhythmically lengthened vowels) often rivals the nuclear pitch accent for having the greatest amplitude.

We now turn to the complex conditions governing nuclear pitch accent placement in questions. We begin with the purely phonological conditioning factors and then turn to morphological conditioning factors.

The transition from high pitch accent to low boundary tone minimally requires two vocalic moras, i.e. either a long vowel or two short vowels. A result of this restriction is that the only final syllable which can carry the nuclear pitch accent in a question IP is one containing a long vowel (CVV). A pitch accented CVV final syllable in a question IP is characterized by a pitch peak followed by a steep pitch fall to the end of the IP. If the final syllable does not contain a long vowel, the nuclear pitch accent falls on the penultimate syllable if it either contains a long vowel (CVV) or is closed by a consonant (CVC). Long vowels include underlying long vowels (including nasalized vowels, which are always long) and rhythmically lengthened vowels.

If the final syllable does not contain a long vowel and the penultimate syllable is neither closed nor contains a long vowel, the nuclear pitch accent falls on the antepenultimate syllable. Because the rhythmic lengthening process ensures that there are never more than two consecutive syllables which are neither CVV or CVC, an antepenultimate syllable carrying the nuclear pitch accent will always either be closed or contain a long vowel (with one morphological exception discussed in the next paragraph). Thus, any syllable (subject to certain exceptions discussed below) carrying the nuclear pitch accent in a question IP will be either CVV or CVC.

Interestingly, there are morphological conditions which interact with the purely phonological conditions governing nuclear pitch accent placement in questions. First, the nuclear pitch accent in verbs does not fall farther to the left than the first syllable of the root. The nuclear pitch accent is restricted from falling on prefixes, even if syllable weight conditions would predict that a prefix would carry the nuclear pitch accent. For example, the verb **tʃim-písa?** in the sentence **kata:t tʃim-písa?** ‘Who looks at him for you?’ consists of the dative prefix **tʃim** plus the root **pisa**. In this form, the nuclear pitch accent (indicated by an acute accent mark in the above example) falls on the penultimate syllable, **pi**, the first of the root, even though purely phonological conditions would predict that the antepenultimate syllable should take the nuclear pitch accent. Another example of a prefix resisting the nuclear pitch accent is found in the final word of the sentence **kata:t ili-písa?** ‘Who looks at herself?’, in which the plural prefix **ho:** surrenders the pitch accent to a light penult.

An interesting by-product of the restriction against prefixal nuclear pitch accents combined with the final H% boundary tone and the H\* on the ultima in statements (see below) is that intonation contrasts between statements and questions are neutralized in the case of an IP final verb containing a monosyllabic CV root. Thus, the nuclear pitch accent in the verb **tʃi-ja** ‘you are’ falls on the second syllable in both statements and questions. When

in a question, the final low boundary tone characteristic of most questions is not realized, since there is insufficient space on which to realize both the H\* pitch accent and the L% boundary tone.

The nuclear pitch accent is not restricted from falling on suffixes, as the accent pattern in the verb **kata:t haf̥a:t-tó:k?** ‘Who was angry? (distant past)’ indicates. In this form, the nuclear pitch accent falls on the remote past suffix **tó:k**. In fact, it seems to be a *requirement* in suffixed verbs that the nuclear pitch accent fall on a syllable in the suffixal complex. Thus, in the question **pisa-lí-tam?** ‘Was I looking at him’, which consists of the root **pisa** plus the 1st person singular suffix **-li** plus the question marker **-tam**, the nuclear pitch accent falls on the 1st person suffix **-li** rather than the syllable **-sa-** which would be expected to take the pitch accent if strictly phonological conditions were observed. In cases where a CV suffix carries a nuclear pitch accent against purely phonological predictions, the vowel is phonetically lengthened. This lengthening of the vowel has the effect of ensuring satisfaction of the phonological requirement that a nuclear pitch accented penult either be closed or contain a long vowel.

An exception to the requirement that a verbal suffix be pitch accented is provided by many word final syllables in question IPs: a word-final syllable must contain a long vowel to be accented. For example, in the question **katahtá: pisá-li** ‘Who am I looking at?’ the 1st person singular suffix **-li** fails to attract the pitch accent because it is the final syllable. In addition to the phonological blocking of pitch accents on final non-CVV syllables, the two exclamatory suffixes, **-ká:** and **-h** plus a nasalized (and therefore long) copy of the preceding vowel, reject the nuclear pitch accent in questions even though they contain a long vowel. Since the exclamatory suffix only occurs as the final syllable of a word, its rejection of the pitch accent does not contradict the earlier generalization made about *non-final* suffixes attracting the nuclear pitch accent. It does, however, mean that we cannot know whether the absence of a pitch accent on the question markers **-tam** and **-ta** (e.g. person **pisá-tam?** ‘Was I looking at him?’) which also always occur word-final, is due to a lexically marked restriction against accented question markers or to the more general restriction against pitch accents on final short vowels.

### 5.3. Interaction between morpholexical pitch accents and nuclear pitch accents

Recall from section 2.3 that certain Chickasaw words carry a morpholexical pitch accent on one syllable, typically the penult but occasionally the antepenultimate or even the preantepenultimate syllable. These nuclear pitch accents are phonetically realized as high tones parallel to nuclear pitch accents. A single IP may have both a morpholexically pitch accented syllable and another syllable with a nuclear pitch accent. In practice, however, this situation occurs rarely, since there is a restriction against high tones (whether due to nuclear pitch accents, morpholexical pitch accents, or boundary tones) on adjacent syllables. In case phonological (or morphological) conditions would predict that the nuclear pitch accent or a H% boundary tone would fall on a syllable immediately adjacent to the morpholexically pitch accented syllable, the second high tone is suppressed. For example, in the IP **tʃofánta** ‘He is cleaner’ n-grade, the only high tone occurring is the morpholexical pitch accent on the penultimate syllable. The final H\* pitch accent normally found on final syllables in statements as well as the final H% boundary tone are suppressed. Similarly, in questions, the nuclear pitch accent does not fall on a heavy penultimate syllable if the antepenult carries a morpholexical pitch accent, or on an antepenult following a preantepenultimate syllable

carrying a morpholexical pitch accent. For example, in the question IP **tʃofâj:aʔta-ta** ‘Is she/he really clean?’ y-grade, the presence of the morpholexical pitch accent on the preantepenult precludes a nuclear pitch accent on the antepenult, as illustrated in Figure 8. This restriction against high tones also overrides the morphologically conditioned requirement that verbal suffixes carry a nuclear pitch accent.

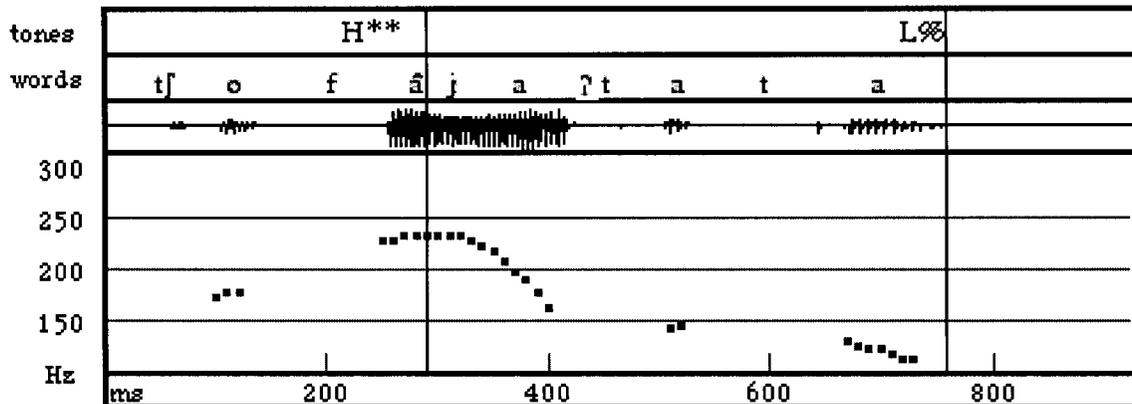


Figure 8. Morpholexical pitch accent in **tʃofâj:aʔta-ta** ‘Is she/he really clean?’ (Note that the morpholexical pitch accent is indicated by a double asterisk.)

If, however, there is at least one syllable separating the morpholexically pitch accented syllable from the potential docking site for the nuclear pitch accent, then both the morpholexical pitch accent and the nuclear pitch accent are realized. For example, in the statement IP consisting of the word **hîki:ʔjâ** ‘She/he is standing’, the morpholexical pitch accent falls on the initial syllable and the nuclear pitch accent falls on the final syllable. Likewise, in the question IP ending in the word **tʃofâj:aʔtaʔtʃita** ‘Will she/he be really clean?’ y-grade, the second syllable carries the morpholexical pitch accent while the penult attracts the nuclear pitch accent. In this particular example, the requirement that the suffix carry a pitch accent can be satisfied without violating the restriction against adjacent high tones. Very rarely it is possible to find a morpholexically accented form containing a syllable which is non-suffixal, not adjacent to the morpholexically accented syllable and phonologically eligible to carry a nuclear pitch accent. In such cases, the nuclear pitch accent surfaces in addition to the morpholexical pitch accent, though the nuclear pitch accent is much weaker than the morpholexical one, as for example, in the word **it:ibâk:aklîʔf-ta** ‘Is she/he making a knocking sound?’

Another circumstance under which two nuclear pitch accents may surface in a single IP is found in biverbal IPs. An example of this is provided by the last two words in the question IP **kata:t iskân:ost iftâj:a** ‘Who’s beginning to be short?’ in Figure 9. In this case, neither of the two pitch accents are morpholexical. The first verb **iskân:ost** ‘be short’ carries a pitch accent, as does the second verb **iftâj:a** ‘begin’. Typically, in cases in which two pitch accents (whether morpholexical or nuclear) occur in a single IP, the first pitch accent is realized with a phonetically higher pitch than the second one as in Figure 9, though it is also possible for the second one to be higher. This latter scenario seems to arise frequently when the first pitch accented syllable is AP initial, perhaps due to a lowering effect attributed to the AP initial low tone.

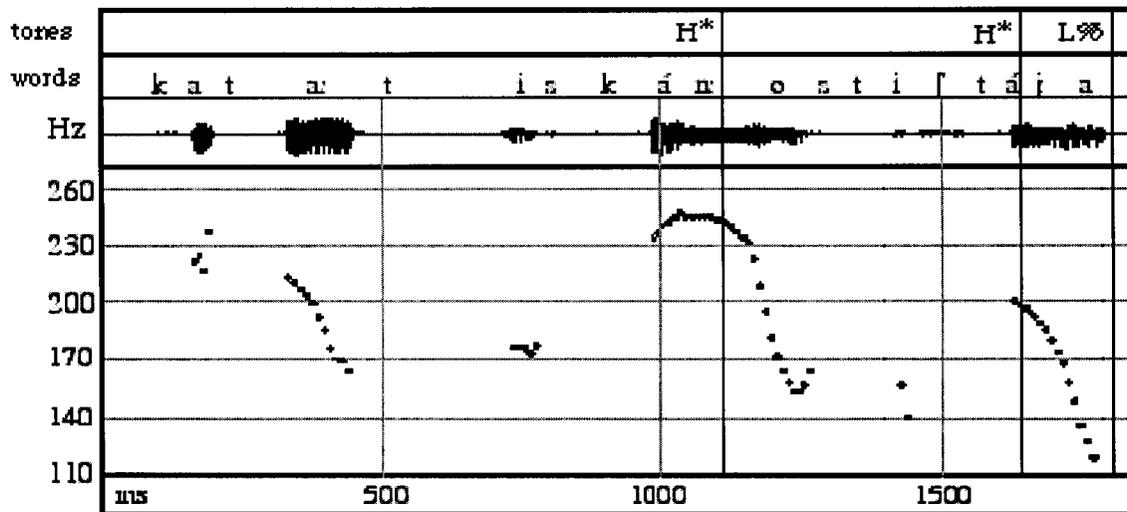


Figure 9. Two pitch accents in question IP *kata:t iskán:ost iftáj:a* 'Who's beginning to be short?'

#### 5.4. Structure of the Accentual Phrase

Most IPs in Chickasaw of sufficient length can be broken down into smaller units each of which is characterized by a recursive tonal pattern independent of the nuclear pitch accent and the final boundary tone of the IP. We may term this small intonational unit the Accentual Phrase (AP). The tonal properties of the AP are most evident in words which are not in final position of the IP. The realization of tones in an IP-final AP is obscured by the nuclear pitch accent and the final boundary tone of IP-final position.

Each morphological word characteristically forms its own AP, although there is a possibility (rarely exercised in the data analyzed) for contiguous short words (shorter than three syllables) to form a single AP and, conversely, for long morphological words to be divided into more than one AP. By morphological word in this context is meant a word which can stand on its own.

In describing the tonal realization of the AP, it is useful to invoke the notion of the sonorant mora, where a short vowel or a sonorant coda consonant receive one mora each and a long vowel receives two moras. The fullest realization of the AP pattern is as [LHHL], a pattern which is typical of APs containing at least three syllables, and two syllable APs consisting of at least three sonorant moras. The [LHHL] pattern is also a marked option in shorter words, where the likelihood of all tones being realized decreases as the duration of the word shortens. The realization of the AP in short words is discussed below.

In APs in which all four tones are realized, the initial low is associated with the left edge of the AP. The first high tone occurs fairly early in the AP; it is generally realized on the second sonorant mora. Thus, if the first syllable of a word contains a long vowel or is closed by a sonorant consonant, the first high tone is usually realized on the first syllable. If, however, the first syllable contains only one mora, the high is delayed until the second

syllable. The actual timing of the first high tone is only loosely linked to the number of sonorant moras. If, for example, a long vowel in the first syllable is phonetically shortened, as at a faster speech rate, the high tone may actually fall on the second syllable rather than the first one.

The second high tone is loosely associated with the beginning of the final syllable of the AP. Syllables intervening between the two high tones are high toned by interpolation. The final high tone is usually followed by a sharp fall in pitch to the final low tone associated with the right edge of the AP. The realization of the AP tones is shown in schematic form in Figure 10. An AP with a canonical tonal realization (**nafo'ba:t**) is illustrated in Figure 11.

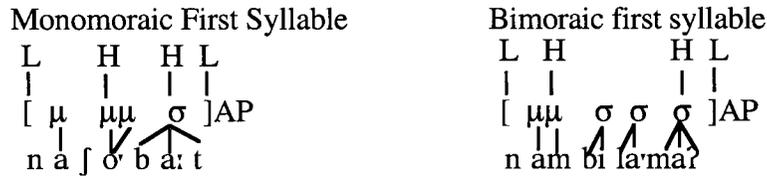


Figure 10. Realizations of the Chickasaw Accentual Phrase

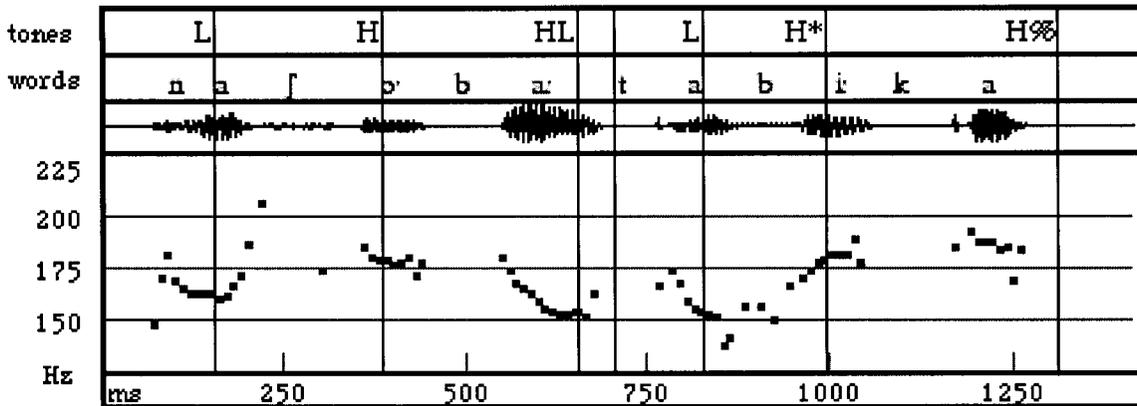


Figure 11. Accentual phrase tones in **nafo'ba:t abika** 'The wolf is sick.'

The final pitch fall is not an invariant property of the AP. If the final syllable contains a long vowel, the pitch fall on the final syllable may optionally be absent, a pattern which is plausibly attributed to the greater stress of long vowels relative to short vowels in the Chickasaw stress system, both at the level of the word and at the level of the IP (see discussion in sections 2.2 and 5.2).

The AP tonal pattern is often truncated in an AP which contains fewer than three sonorant moras. The most common tonal pattern in a short AP is [HL] with the H realized at the beginning of the AP and the L on the right edge of the AP. This [HL] intonation pattern is consistent with the observation that disyllabic words may be realized with prominence on the first rather than the final syllable (Munro 1996). The result is a steady fall in pitch throughout the AP. Parallel to the realization of the nuclear pitch accent in the IP, the tonal realization of the AP is sensitive to the morphological structure of words. For purposes of determining the ability of a word to manifest the full tonal realization of the AP, suffixes are

typically ignored. Thus, the word **katait** in Figure 9 above is a short AP consisting of a bimoraic root **kata** plus a suffix.

Another more marked option in a short AP is to not realize either of the high tones; the result is a level low toned AP with a L linked to the beginning of the AP and a L associated with the end of the AP.

In a word consisting of at least three syllables and in a two syllable word in which the root contains at least one syllable with two sonorant timing positions in the rime (i.e. CVR where R is either a sonorant consonant or the second half of a long vowel), both the initial pitch rise and the final pitch fall are usually realized.

There is a strong preference for the AP to coincide with morphological word boundaries. Thus, each morphological word characteristically is a single AP and each AP typically consists of a single morphological word. A by-product of this strong tendency toward alignment of AP and morphological word boundaries is that a sequence of two CVCV words is characteristically treated as two separate APs rather than one. The likelihood of two morphological words being produced as a single AP is greater for words which are constituents. For example, a sequence of object followed by a verb, as in [**fala pisa**]<sub>AP</sub> 'He's looking at him', is more likely to be realized as a single AP than a sequence of subject plus verb. Crucially, though, the likelihood of any sequence of two morphological words being uttered as a single AP is small. In cases of multiple morphological words forming a single AP, there are typically segmental correlates associated with the intonation parse. For example, a dental stop in word-final but AP medial position is typically flapped unlike dental stops in other positions, including in AP final position.

On the other hand, long morphological words (those greater than seven syllables) may consist of more than one AP, where the likelihood of the morphological word being divided into multiple APs increases commensurately with the length of the word. For example, the nine syllable word **ak-it-i-manompo?lo-ki-tok** 'I didn't speak for him' is characteristically divided into two APs consisting of a six syllable AP followed by a three syllable AP, i.e. [**akit:imanompo?**]<sub>AP</sub>[**lokitok**]<sub>AP</sub>. Note that given the data examined thus far it is difficult to know the degree to which the parse of a single morphological word into single APs is sensitive to morphology. The division of longer morphological words into multiple APs appears to be sensitive to the morphological make-up of a word, though the details of this influence of morphology on the intonational parse require further investigation.

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## Anti-faithfulness and the Koasati Plural<sup>†</sup>

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### 0.0 Introduction

Subtractive morphological operations have been defined (Martin 1988) as those in which a grammatically characterizeable unit (segmental or prosodic) is truncated from the right or left periphery of some morphological unit (typically a root or word). In fig. (1), we have one of the subtractive paradigms most discussed in recent literature on the subject<sup>1</sup>, the Koasati Plural (Kimball 1991; Broadwell 1993; Lombardi & McCarthy 1991; Weeda 1992). In Koasati, a Muskogean language still spoken in parts of Louisiana and Texas, the plural form of an indicative verb may be formed by one of several means: affixation, suppletion, and—most interestingly for our purposes—truncation. In the truncative plurals, three distinct patterns emerge. The first, shown (1a), is most straightforwardly described as truncation of a root-final rhyme; the second, (1b), manifests truncation of the root-final coda.

(1) Koasati Singular > Plural allomorphy<sup>2</sup>

a) Rhyme-Deletion

| <i>singular</i> | <i>plural</i>        | <i>gloss</i>             |
|-----------------|----------------------|--------------------------|
| pitáffin        | pít■lin <sup>3</sup> | 'to slice up the middle' |
| akocofótlin     | akocóf■fin           | 'to jump down'           |
| albitílin       | albit■lin            | 'to place on top of'     |
| facó:kan        | fás■kan              | 'to sleep with someone'  |

b) Coda-Deletion

|           |            |                 |
|-----------|------------|-----------------|
| asikóplin | asiko:■lin | 'to breathe'    |
| kacáḥlin  | kacá:■lin  | 'to bite s.t.'  |
| akapóskan | akapó:■kan | 'to be pinched' |

For the present, it is crucial to note the following facts of the Koasati data. One: that in each case it is the size of the truncated material that remains constant. For each class of plurals, we find a single, grammatically describable constituent (whether rhyme or single coda consonant) *in absentia* from the plural form. Two: the size of the segmental material remaining in the plural is variable. This fact is particularly dramatic in the rhyme deletion cases, where we find plural forms shaped CVC-, CVCVV-, VCCVCCVC-, etc. These are the principal motivations for our designation of the phenomena as subtractive truncation, rather than *templatic*, where a base form is truncated down to some minimal template size.

Several notable challenges for the Optimality Theory of Prince & Smolensky (1993), McCarthy & Prince (1993a, *et seq.*) present themselves in analysis of subtractive morphology. First: since as it is obviously not the case that *faithfulness* constraints can

be held accountable for an effective corruption of surface material from an underlying form, we would expect subtractive morphology to in some manner result from *markedness*. However, if the underlying forms are—but for some morphosyntactic specification or zero morpheme—identical in alternations such as the Koasati SINGULAR > PLURAL shown above, why do we find subtraction in one and not the other? Barring morpheme-specific markedness constraints, we would expect the grammar of a language to return identical optima for two inputs not differing in segmental make-up. Second: subtractive morphology is, like affixation, local to an edge. As affixal locality effects in OT are principally got with *alignment* (McCarthy & Prince 1993b) of morphological and prosodic categories in the output—e.g., a suffix aligns to the right edge of the prosodic word, and a prefix, the left—we would expect similar constraints to play a part in designating the locus of truncation in the cases considered here. Unfortunately (and obviously), since alignment constraints must refer to material present in the output, there is no means by which they may position a ‘morpheme’ which has no exponence. In short, there is no way to align subtraction. Third: the Koasati data (1) demonstrates pointedly that a subtractive process may target a rhyme or even syllable for truncation. This fact seems at first glance intractable to an OT hewing closely to the “Goals of Prosodic Morphology” set out in McCarthy & Prince (1994b, 1999), in that they suggest some templatic component of the process<sup>4</sup>.

A solution to these dilemmas presents itself in several recent developments in OT—developments which require some re-tuning of standard assumptions about faithfulness theory. Crucial to the approach advocated here is the notion that an Optimality-theoretic grammar is not limited to only two constraint types—faithfulness and markedness—but rather must admit *anti-faithfulness* constraints to the inventory of CON. It will be shown in this paper that a Faith/Markedness/Anti-faith OT can account for subtractive morphological phenomena in a conceptually simple, highly constrained manner. I will argue that subtraction in the Koasati plural is best explained by the interaction of high-ranked anti-faithfulness constraints—constraints, after Alderete (1999), promoting segmental contrast with the morphologically related singular output—with otherwise provably active constraints on prosodic and morphological well-formedness. Locality conditions on the subtraction will be shown to follow from the ranking of standard positional faithfulness constraints, and subtractive allomorphy will result from a two-way morphological class distinction in the plural forms. Lastly, the account will be compared with a recent account of similar subtractions in the Uto-Aztecan language Tohono ‘O’odham.

### 1.0 Transderivational Anti-faithfulness

The essential framework we will assume is that of Alderete (1999), Transderivational Anti-Faithfulness Theory (TAFT), which—not surprisingly—is predicated largely on the larger body of assumptions implicit in the Transderivational Faithfulness Theory of Benua (1997; see also Kenstowicz 1996, Burzio 1995). Alderete argues that a grammatical force exactly antithetical to the O-O faithfulness constraints of Benua’s theory, O-O *anti-faithfulness* constraints, *penalize* phonological similarity between

morphologically related forms. Furthermore, it is argued that anti-faithfulness is *only* morphological in nature, and that formulation of an anti-faithfulness constraint over an IO-correspondence relation is impossible. The importance of these assertions is twofold. The first follows from the typically idiosyncratic nature of the types of alternations which lend themselves to an anti-faithfulness analysis (polarity reversal in Luo and various morpho-accentual phenomena in Japanese and Russian (Alderete 1999), circular chain shifts in Taiwanese (Horwood, *in prep.*), and Turkish emphatic reduplication (Kelepir 1999). The second is necessary to prevent a considerable amount of leakage from Optimality-theoretic learning theory (Prince & Tesar 1999)—the inclusion of I-O anti-faith in a grammar explodes the space of possible grammars the learner must consider.

An anti-faithfulness constraint in Alderete’s theory is defined as the logical negation of a faithfulness constraint. Taking for example a constraint immediately applicable to the problem at hand, consider  $\neg$ MAX, negatively quantified from MAX:

- (2) MAX-Cat (McCarthy & Prince 1999)  
Every element of type *Cat* in  $S_1$  has a correspondent element of type *Cat* in  $S_2$ .

$$\forall x[x \in \{S_1 \cap \text{Cat}\} \rightarrow \exists y[y \in \{S_2 \cap \text{Cat}\} \wedge x \mathfrak{R} y]]$$



$\neg$ MAX-Cat: (‘Delete at least one *Cat*.’)

It is **not** the case that every element of type *Cat* in  $S_1$  has a correspondent element of type *Cat* in  $S_2$ .

$$\neg \forall x[x \in \{S_1 \cap \text{Cat}\} \rightarrow \exists y[y \in \{S_2 \cap \text{Cat}\} \wedge x \mathfrak{R} y]]$$

## 2.0 Anti-faith Motivates Segment Deletion

We now have a conceptually simple and highly constrained means of motivating morphologically-conditioned subtraction.  $\neg$ MAX will penalize any candidate whose output segmentism is *maximally* identical to that of some corresponding output base; if a single segment of the corresponding output base is not present in the surface form of the derived word, the constraint will be satisfied. Where  $\neg$ MAX dominates all related MAX constraints (i.e., “related” referring to all constraints, I-O, O-O, or B-R, of the same segment, feature, tone, position, etc. type) in a grammar, subtraction will occur. In Fig. (3), we may see how application of this morphological architecture is played out in the Koasati case, for a singular form *pitáffin* and rhyme-truncated plural *pítlin*, with correspondence ( $\mathfrak{R}$ ) relations shown by arrows<sup>5</sup>.

|        |                |          |                               |        |
|--------|----------------|----------|-------------------------------|--------|
| (3)    |                | Singular |                               | Plural |
| Input  | /pitaf-li-n/   |          | /pitaf-li-n-Ø <sub>PL</sub> / |        |
|        | ↑↓             |          | ↑↓                            |        |
| Output | pitáffin       | →        | pítlin                        |        |
|        | O <sub>S</sub> |          | O <sub>PL</sub>               |        |

It is immediately apparent from the surface exponence of each input string that faithfulness constraints defined over the  $O_S$ - $O_{P1}$  relation are *violated*. The first violation results from some imperative to preserve underlying segmental identity, as the underlying segmentism of the indicative morpheme *-li-* resists in the plural the place assimilation that it undergoes in the singular<sup>6</sup>. This fact highlights the nonderivational nature of the system at hand; were the plural directly derived from the singular, we would expect an unattested output *pítfin*, where the product of place assimilation (/f/ → [ff]) in the singular is carried over to the plural. It is the parallel nature of the architecture we assume here that allows surface morphological similarity along with adherence to underlying morphological structure. The second—and more pronounced—violation of faith to  $O_S$ - $O_{P1}$  is obviously the truncation of the root-final rhyme. Further examples of this type of truncation are shown (4) below.

(4) VC Rhyme deletion (Martin 1988 and Kimball 1991)

|                            |                           |  |                          |
|----------------------------|---------------------------|--|--------------------------|
| a) <i>af</i> ~ $\emptyset$ |                           |  |                          |
| pitáffin                   | pít■■lin                  |  | 'to slice up the middle' |
| akoláffkan                 | akol■■ká:cin <sup>7</sup> |  | 'to erode and collapse'  |
| tosáffin                   | tós■■lin                  |  | 'to cut a piece out of'  |
| latáffkan                  | lát■■kan                  |  | 'to kick s.t.'           |
| kaláffin                   | kál■■lin                  |  | 'to mark s.t.'           |
| tałáffkan                  | táł■■kan                  |  | 'to whittle s.t.'        |
| baháffin                   | báh■■lin                  |  | 'to stab s.t.'           |
| b) <i>ap</i> ~ $\emptyset$ |                           |  |                          |
| tiwáp-li-n                 | tíw■■-wi-n                |  | 'to open s.t.'           |
| lofáp-li-n                 | lof■■-fi:ci-n             |  | 'to chip lengthwise'     |
| yíłáp-li-n                 | yíł■■-łi-n                |  | 'to tear s.t. down'      |
| lasáp-li-n                 | lás■■-li-n                |  | 'to lick s.t.'           |
| łomáp-li-n                 | łóm■■-mi-n                |  | 'to whip s.t.'           |
| kaháp-li-n                 | káf■■-fi-n                |  | 'to dip s.t. up'         |
| c) <i>ip</i> ~ $\emptyset$ |                           |  |                          |
| cíłip-ka-n                 | cíł■■-ka-n                |  | 'to spear s.t.'          |
| misíp-li-n                 | mís■■-li-n                |  | 'to wink'                |
| obakhítíp-li-n             | obakhít■■-li-n            |  | 'to go backward'         |
| d) <i>it</i> ~ $\emptyset$ |                           |  |                          |
| limít-ka-n                 | lín■■-ka-n                |  | 'to swallow s.t.'        |
| e) <i>op</i> ~ $\emptyset$ |                           |  |                          |
| fotóp-ka-n                 | fót■■-ka-n                |  | 'to pull s.t. up'        |
| iyyakkohóp-ka-n            | iyyakkóh■■-ka-n           |  | 'to trip'                |
| f) <i>of</i> ~ $\emptyset$ |                           |  |                          |
| łobóf-fi-n                 | łób■■-bi-n                |  | 'to pierce s.t.'         |
| g) <i>ot</i> ~ $\emptyset$ |                           |  |                          |
| akocofót-li-n              | akocóf■■-fi-n             |  | 'to jump down'           |

|    |               |                  |  |                         |
|----|---------------|------------------|--|-------------------------|
| h) | <i>as</i> ~ Ø |                  |  |                         |
|    | tipás-li-n    | típ■■-li-n       |  | ‘to pick s.t. off’      |
| i) | <i>at</i> ~ Ø |                  |  |                         |
|    | simát-li-n    | sím■■-mi-n       |  | ‘to cut up tanned skin’ |
| j) | <i>ał</i> ~ Ø |                  |  |                         |
|    | kawát-łi-n    | káv■■-wi-n       |  | ‘to snap s.t.’          |
| k) | <i>am</i> ~ Ø |                  |  |                         |
|    | tafilám-mi-n  | tafl■■-li-n      |  | ‘to overturn s.t.’      |
| l) | <i>ay</i> ~ Ø |                  |  |                         |
|    | onasanáy-li-n | onasan■■-ní:ci-n |  | ‘to twist s.t. on’      |

The purpose of this welter of data is simple: to alert the reader of the simple absence of any distributional regularity in the SINGULAR > PLURAL mappings which might condition the prosodic shape (= rhyme) of the subtraction. Bi-, tri-, and quadra-syllabic roots are all equally subject to the process; selection for the following auxiliary suffixes *-ka-*, *-li-*, or *-lici-* is arbitrary; high pitch accent (marked [̎]) falls regularly on the penultimate syllable—of either the singular or plural—and conditions lengthening; and any of the following ten vowel-consonant pairs may be subject to the deletion: {af, ap, ay, as, at, ał, op, of, ot, ip, it}. It is fair to conclude<sup>8</sup> that a purely phonological explanation for the phenomena will not be found. As general markedness cannot trigger deletion in the plural without also triggering it in the singular, we will contend here that the following anti-faithfulness constraint motivates the subtraction:

(5) –MAX-V: (‘Delete at least one vowel.’)

It is not the case that every V in S<sub>1</sub> has a correspondent V in S<sub>2</sub>.

–MAX-V explicitly penalizes correspondence of vocalism. In a case where both a vowel and consonant delete, as in *pitáffin* > *pílin* above, something more must come into play to effect VC rhyme truncation, else we might anticipate a “gapped” plural form such as *pit■f-fi-n*. Kimball (1991) reports of Koasati that “three member consonant clusters are very rare, and most are the result of the h-grade.”<sup>9</sup> Kimball’s generalization admits a simple analysis in OT terms.

(6) \*COMPLEX (Prince & Smolensky 1993)

No more than one C or V may associate to any syllable position node.

Ranked above MAX-IO, \*COMPLEX effectively prohibits word-medial consonant clusters of more than two members—exactly the structural configuration which would emerge if –Max-V were satisfied *without* deletion of a proximate consonant. And as we can see from candidate (e) in tableau (1), where anti-faith would leave a syllable structure marked by prosodic well-formedness conditions, additional truncation takes place. Note that subtraction is still constrained in the theory by the lower-ranked MAX; being gradiently violable, the faithfulness constraint is only deactivated to satisfy higher-ranked

constraints, and effectively prohibits gratuitous truncation of material, as shown in candidate (b).

**Tableau 1.**VC]<sub>root</sub> deletion. (*pitáffin* > *pít■■lin*)

| /pitaf-li-n-Ø/ | *COMPLEX | ¬MAX-V-O <sub>s</sub> O <sub>pl</sub> | MAX-IO |
|----------------|----------|---------------------------------------|--------|
| a. pít■■lin    |          |                                       | **     |
| b. pí:■■■lin   |          |                                       | ***!   |
| c. pi.táf.fin  |          | *!                                    |        |
| d. pi.tá:■lin  |          | *!                                    | *      |
| e. pít■f.fin   | *!       |                                       | *      |

SINGULAR  
Output Base:  
[pi.táf.fin]

A sixth possible candidate *pit■f-■i-n*, where the second root vowel is truncated to satisfy ¬MAX and the initial consonant of the suffix is truncated to satisfy \*COMPLEX, is effectively ruled out by the I-CONTIG(uity)<sup>10</sup> constraint of McCarthy & Prince (1995).

## (7) I-CONTIG ('No skipping.')

The portion of  $S_1$  standing in correspondence forms a contiguous string.

Domain( $\mathfrak{R}$ ) is a single contiguous string in  $S_1$ .

So we see how the interaction of anti-faithfulness with another active constraint in the grammar may result in subtraction of more than a single segment. In the long-vowel deletion cases, the effects of the ANTI-FAITH » FAITH ranking are even more straightforward.

## (8) Long-vowel Rhyme Deletion

a) *a:* ~ Ø

|                |               |                         |
|----------------|---------------|-------------------------|
| ataká:-li-n    | aták■-li-n    | 'to hang something'     |
| icoktaká:-li-n | icokták■-li-n | 'to open one's mouth'   |
| acokcaná:-ka-n | acokcán■-ka-n | 'to quarrel w/ someone' |

b) *i:* ~ Ø

|              |             |                      |
|--------------|-------------|----------------------|
| albití:-li-n | albít■-li-n | 'to place on top of' |
| atiní:-li-n  | atín■-ni-n  | 'to burn s.t.'       |
| acití:-li-n  | acít■-li-n  | 'to tie s.t.'        |

c) *o:* ~ Ø

|             |            |                         |
|-------------|------------|-------------------------|
| facó:-ka-n  | fás■-ka-n  | 'to sleep with someone' |
| apołó:-ka-n | apół■-ka-n | 'to sleep w/ someone'   |

Since there is no errant consonant to potentially violate high-ranked \*COMPLEX or any other constraint but MAX-IO, subtraction proceeds simply, as shown in Tableau (2).

**Tableau 2.**V:]<sub>root</sub> deletion. (*ataká:lin* > *aták■■lin*)

|   | /ataka-li-n-Ø/ | ¬MAX-V-O <sub>S</sub> O <sub>Pl</sub> | MAX | SINGULAR<br>Output Base:<br>[a.ta.ká:lin] |
|---|----------------|---------------------------------------|-----|---|
| ☞ | a. a.ták■■lin  |                                       | *   |   |
|   | b. a.ta.ká:lin | *!                                    |     |   |

**2.1 Localizing Subtraction**

An obvious question arises at this point: Why is truncation from the right edge of the root rather than the left? Nothing in the anti-faithfulness constraints we have considered here is capable of localizing truncation to one edge or the other; ¬Max is satisfied by any deletion, anywhere. Let us take the following tack: the ranking of L(ef)- and R(ight)-ANCHOR (McCarthy & Prince 1995) relative to root CONTIG(uity) may localize the site of deletion in a given grammar.

(9) {RIGHT, LEFT}-ANCHOR( $S_1, S_2$ )

Any element at the designated periphery of  $S_1$  has a correspondent at the designated periphery of  $S_2$ .

Let  $Edge(X, \{L, R\})$  = the element standing at the  $Edge = L, R$  of  $X$ .

R-ANCHOR. If  $x = Edge(S_1, R)$  and  $y = Edge(S_2, R)$  then  $x \mathfrak{R} y$ .

L-ANCHOR. Likewise, *mutatis mutandis*.

L- and R-ANCHOR are *positional* faithfulness constraints and, when composed over the I-O faithfulness dimension, act to penalize truncation from one edge of the input string or the other. Medial truncation is penalized by similarly by I-CONTIG.

## (10) I-CONTIG ('No skipping.')

The portion of  $S_1$  standing in correspondence forms a contiguous string.

The essential argument here is that, in Koasati, L-ANCHOR and I-CONTIG dominate R-ANCHOR, and, since it is not apparent what markedness constraints could effect the positioning of *nothing* within a string, this ranking determines the default edge for segmental truncation by anti-faithfulness<sup>11</sup>, as shown in Tableau (3).

**Tableau 3.**

Positional faithfulness selects truncation site.

|   | /pitaf-li-n-Ø/ | L-ANCHOR | I-CONTIG <sub>Root</sub> | R-ANCHOR |
|---|----------------|----------|--------------------------|----------|
| ☞ | a. pít■■lin    |          |                          | *        |
|   | b. ■■táf.fin   | *!       |                          |          |
|   | c. pí■■f.fin   |          | *!                       |          |

**2.2 Subtractive Allomorphy**

Part of the inherent interest of the Koasati problem comes in the form of apparent subtractive allomorphy in the plural. The second plural allomorph is characterized by

truncation of the final coda consonant of the root and compensatory lengthening of the remaining root-final vowel under penultimate pitch-accent. Obviously, the effects of  $\rightarrow$ MAX-V are not seen in these data.

## (11) Coda-deletion

|                              |               |  |                                  |
|------------------------------|---------------|--|----------------------------------|
| a) $t \sim \emptyset$        |               |  |                                  |
| <i>singular</i>              | <i>plural</i> |  | <i>gloss</i>                     |
| famót-ka-n                   | famó:■-ka-n   |  | 'to wave'                        |
| bikót-li-n                   | bikó:■-li-n   |  | 'to bend s.t. between the hands' |
| asipát-li-n                  | asipá:■-li-n  |  | 'to get a splinter'              |
| tabát-ka-n                   | tabá:■-ka-n   |  | 'to catch s.t.'                  |
| topát-ka-n                   | topá:■-ka-n   |  | 'to recede'                      |
| b) $s \sim \emptyset$        |               |  |                                  |
| akapós-ka-n                  | akapó:■-ka-n  |  | 'to be pinched'                  |
| okhabós-ka-n                 | okhabó:■-ka-n |  | 'to sink'                        |
| labós-li-n                   | labó:■-li-n   |  | 'to extinguish s.t.'             |
| ħibós-li-n                   | ħibó:■-li-n   |  | 'to squash s.t.'                 |
| hifós-ka-n                   | hifó:■-ka-n   |  | 'to breathe'                     |
| c) $f \sim \emptyset$        |               |  |                                  |
| ħatóf-ka-n                   | ħató:■-ka-n   |  | 'to melt'                        |
| yicóf-ka-n                   | yicó:-ka-n    |  | 'to shrivel'                     |
| ħicóf-fi-n                   | ħicó:■-li-n   |  | 'to chip by accident'            |
| d) $p \sim \emptyset$        |               |  |                                  |
| asikóp-li-n                  | asikó:■-li-n  |  | 'to breathe'                     |
| ħiyáp-li-n                   | ħiyá:■-li-n   |  | 'to step on s.t.'                |
| e) $\text{ʈ} \sim \emptyset$ |               |  |                                  |
| kacáʈ-ħi-n                   | kacá:■-li-n   |  | 'to bite s.t.'                   |

It has been argued in the serial analyses of Broadwell (1993), Weeda (1992), Martin (1988), and Hardy & Montler (1988)<sup>12</sup> that the rhyme-deletion/coda-deletion allomorphy in Koasati must be to some degree a matter of lexical idiosyncrasy. Taking this observation for fact, let us posit that there are, in effect, two independent Koasati subtractive plurals—we will refer to the rhyme-deletion plural as PLURAL-1 and the coda-deletion plural as PLURAL-2—and that each may be subject to a different anti-faithfulness effect. We now see the full benefit of the Alderetic approach to anti-faithfulness outlined in §1.0 above. Crucial to the transderivational correspondence model of Benua is the notion that the morphological identity relation between a derived word and its base is *subcategorizational*: a given morpheme selects for a given correspondence relation just like it selects for its status as a pre- or suffix and the categorial status of the stem to which it attaches. This provides us with a simple means of encoding the lexically specified

nature of Koasati allomorphy without completely depriving the grammar of its role in realizing the phonological form the subtraction is to take. Because each morpheme selects for a different OO-correspondence relation ( $\mathfrak{R}$ ), and since the set of transderivational (anti-)faithfulness constraints is re-rankable for each  $\mathfrak{R}$ , it follows that the anti-faithfulness constraint “active” (i.e., ranked above MAX-IO) in the rhyme-deletion plural,  $\neg$ MAX-V, need not have any effect at all on the coda-deletion plural, which is in turn subject to a different—but similarly high-ranked—anti-faithfulness constraint,  $\neg$ MAX-C. This is schematized in fig. (12) and *tableauifié* (4).

(12) Lexical selection for O-O relation ( $\mathfrak{R}$ )

|                    |                            |                            |
|--------------------|----------------------------|----------------------------|
| morpheme:          | PLURAL-1                   | PLURAL-2                   |
| relation:          | $O_S \mathfrak{R} O_{P-1}$ | $O_S \mathfrak{R} O_{P-2}$ |
| active constraint: | $\neg$ MAX-V               | $\neg$ MAX-C               |

**Tableau 4.**Coda-deletion allomorph. (*fomótkan* – *fomó:■kan*)

| /fomot-ka-n-Ø/ | $\neg$ MAX-C- $O_S O_{P-2}$ | $\neg$ MAX-V- $O_S O_{P-1}$ | MAX-IO |  |
|----------------|-----------------------------|-----------------------------|--------|--|
| a. fo.mó:■.kan |                             | <i>n/a</i>                  | *      | SINGULAR<br>Output Base:<br>[fo.mót.kan] |
| b. fo.mót.kan  | *!                          | <i>n/a</i>                  |        |  |
| c. fóm■.kan    |                             | <i>n/a</i>                  | *!*    |  |

If we did not find two distinct types of morphologically (i.e., *non-phonologically*) conditioned subtraction in Koasati, we could convincingly argue for a more general anti-faithfulness, simply mandating that two corresponding outputs be different in some way, much as Urbanczyk (1998) argues for reduplicative allomorphy in Halq’emeylem (Central Coast Salish). In (5) we can see how this would work in the abstract. Suppose that an input “A” is morphologically complex, and that our anti-faithfulness constraint DISTINCT is active upon the OO-correspondence relation extant between “A” and an identical output base (i.e., also “A”). Suppose further the existence of two faithfulness constraints, one militating against mutation of “A” to “B”, (F:A  $\nrightarrow$  B), and another “a” to “C”, (F:A  $\nrightarrow$  C).

**Tableau 5.**Anti-faithfulness countermands F<sup>+</sup>

| /A/ | DISTINCT | FAITH:A $\nrightarrow$ B | FAITH:A $\nrightarrow$ C |               |
|-----|----------|--------------------------|--------------------------|---------------|
| A   | *!       |                          |                          | OO Base:<br>A |
| B   |          | *!                       |                          |               |
| C   |          |                          | *                        |               |

As can be seen in the tableau, this results in the availability of only one species of anti-faithful optimum: the one that violates the bottom-most faithfulness constraint in the hierarchy. Where phonological factors intervene, as in Halq’emeylem, more than one

type of subtraction may arise, resulting in apparent allomorphy. In Koasati, where no phonological factors condition the subtractive allomorphy, we could predict only one type of subtraction.

### 3.0 A Comparison Case: The Tohono 'O'odham Perfective

Subtractive alternations similar to those of Koasati are found in the Uto-Aztecan language Tohono 'O'odham<sup>13</sup>. As shown in fig. (i), we again find two varieties of constituent-final subtraction, rhyme- and coda-deletion:

(13) Tohono O'odham Rhyme deletion

a) Rhyme deletion

| <i>Impf.</i> | <i>Perf.</i> | <i>gloss</i>       |
|--------------|--------------|--------------------|
| ceposid      | cepos■       | 'branded'          |
| hupan        | hup■         | 'pulled out thorn' |
| huḍuñ        | huḍ■         | 'descended'        |
| keliw        | kel■         | 'shelled corn'     |
| bijim        | bij■         | 'turned around'    |

b) Coda deletion

|       |       |                     |
|-------|-------|---------------------|
| ñeok  | ñeo■  | 'spoke'             |
| bisck | bisc■ | 'sneezed'           |
| mak   | ma:■  | 'gave'              |
| dagşp | dagş■ | 'pressed with hand' |

Fitzgerald (1997) proposes a simple analysis of the TO data, based on the following observations. First, perfective verbs are always (at least) one consonant shorter than correlate imperfectives: *ñeok* > *ñeo■*. Second, truncation is always from the right edge of the morphological word: *bisck* > *\*bisc■*, *\*bis■k*, *\*■isck*. Finally, in the perfective data, high vowels do not occur after coronals word-finally: *ceposid* > *\*ceposi■*. Fitzgerald proposes to account for these generalizations in the following manner. First, it is argued that the perfective morpheme is formulated as a constraint:

(14) TRUNC

The Perfective output contains fewer segments than the Imperfective output.

The motivating of perfective morphology is a simple matter. If TRUNC is ranked above MAX-IO, some segmentism must be lost in the optima, just as with  $\neg$ MAX in the above analysis of Koasati. Given the loose comparative formulation of TRUNC—"fewer than"—truncation of more than one segment is prohibited by a gradiently violable MAX-IO.

Since, as noted above, distributional evidence seems to be in favor of rhyme-deletion only where a word-final [+cor][+high] sequence would arise after truncation of a final C, Fitzgerald attributes the apparent subtractive allomorphy in TO to a phonological force:

- (15) \*CORONAL-HIGH  
 [+cor][+high] sequences are prohibited.

Ranked above MAX-IO but below CONTIG, \*CORHI effectively prevents any candidate with a word-final [+cor][+hi] sequence from emerging<sup>14</sup>. The ranking of CONTIG » \*CORHI is necessary to prevent the markedness constraint from ruling out candidates with word-medial [+cor][+hi] sequences.

Fitzgerald's analysis is straightforward and conceptually appealing, but suffers some formulaic challenge. Fitzgerald's constraint, at the heart of it, enforces the realization of a morphosyntactic feature, PERFECTIVE, where there is no overt affix to do the work. This sort of morpheme-as-constraint approach to word-formation has emerged in OT in recent years (see, for example, Yip 1995) as an apparent reflex of the "item-and-process" model of morphology advocated by Anderson (1992). Such an approach supposes that the phonological component of the grammar receives from the syntax a fully featured—but otherwise simplex—word, and that the surface segmental realization of affixal material is brought about by phonological rules (or constraints) which explicitly give phonological content to abstract morphosyntactic features. Words are not, as in the traditional "item-and-arrangement" approach, formed by the concatenation of independent lexical entities; there is no plural morpheme "-s" in the English lexicon, for example, but a rule or constraint in the phonology: PLURAL="s".

The principal objection to this approach is that there is, in effect, no upper bound on what may constitute a "process", whether formalized as a rule or as a constraint. While TRUNC is relatively innocuous from a typological standpoint, its present conception might permit to our theory of UG a host of other constraints of a highly arbitrary and construction-specific nature, ultimately voiding the theory of much predictive power. Imagine, for example, a constraint INVERT: 'The order of segments in the plural is inverted in the singular'. E.g., *dog* > *god*. This seems highly undesirable. While it is obvious that a considerable body of morphological processes—subtractive morphology included—cannot be attributed to concatenative morphology alone, it is incumbent upon the researcher to posit a *constrained* theory of processual morphology, rather than coin morpheme-constraints on an ad hoc basis.

A treatment of the phenomenon within the larger body of TAFT—simply construing a high-ranked –MAX-C over the IMPERFECTIVE > PERFECTIVE correspondence relation—situates it within such a constrained theory of non-concatenative morphology. The formulation of an anti-faithfulness constraint is restricted and non-arbitrary; from a finite body of faithfulness constraints can only come a finite body of anti-faithfulness constraints, ranked against the fixed markedness hierarchy of the language. Furthermore, designating segmental type in the constraint provides simple explanation for two additional classes of perfective, one which does not truncate at all, and one which shows only truncation of a medial laryngeal.

## (16) “Exceptional” Perfectives (Hill &amp; Zepeda 1992)

## a) No truncation

|              |                        |
|--------------|------------------------|
| <i>Impf.</i> | <i>gloss</i>           |
| gagswua      | ‘combing’              |
| dada         | ‘arriving’             |
| mu:          | ‘wounding by shooting’ |
| bia          | ‘dishing out food’     |
| ’eñga        | ‘owning’               |

## b) Laryngeal truncation

|              |              |                  |
|--------------|--------------|------------------|
| <i>Impf.</i> | <i>Perf.</i> | <i>gloss</i>     |
| gi’a         | gi■a         | ‘grasped’        |
| hu’a         | hu■a         | ‘raked together’ |
| mu’a         | mu■a         | ‘killed-SG-OBJ’  |

The data in (16a) demonstrate that imperfectives which end in a vowel cannot truncate<sup>15</sup>. This follows simply if the anti-faithfulness constraint is attuned to consonantism. In (16b), we find medial truncation of a laryngeal in the perfective. This surprising fact can be made to follow if we assume that the laryngeal is underlyingly word-final in the imperfective, and metathesizes on the surface, as hypothesized by Hill & Zepeda (1992); its truncation in the perfective would not, therefore, result in violation of CONTIGUITY, as shown in Tableau (6) below.

**Tableau 6.**

C-truncation in TO

|   | /gagswua/  | CONTIG | L-ANCHOR | ¬MAX-C | MAX |
|---|------------|--------|----------|--------|-----|
| ☞ | a. gagswua |        |          | *      |     |
|   | b. gagswu■ |        |          | *      | *!  |
|   | c. ■agswua |        | *!       |        | *   |
|   | d. ga■swua | *!     |          |        | *   |
|   | /gia’/     |        |          |        |     |
| ☞ | e. gia■    |        |          |        | *   |
|   | f. gi’■    |        |          | *!     | *   |
|   | g. ■i’a    |        | *!       |        | *   |

**4.0 The Final Tally**

Occam’s Razor is a yardstick by which grammatical frameworks must be evaluated. However, when an elegant theory of grammar is confronted with natural language phenomena which it cannot account for in an enlightening way, something must give. A leading idea is that OT should be, in the terminology of Moreton (1996), *conservative*—that CON should be composed of only faithfulness and markedness constraints because no other type of constraint is needed. As I believe we have seen in the subtractive morphology cases examined here, this is not a condition which can hold over a grammar of natural language without significant loss of theoretical insight. The anti-faithfulness

approach we have advocated captures the descriptive facts of morphological subtraction in a conceptually simple manner; it makes no reference to a syllable or rhyme template, which have been crucial to pre-OT accounts of the phenomena and are now—by Generalized Template Theory of McCarthy & Prince (1993a)—considered superfluous to an explanatory theory of UG; and it subsumes subtractive morphology under a single set of theoretical assumptions which also account for other “idiosyncratic” processes of natural language, including segmental exchange processes, morpho-accentual phenomena, and circular chain shifts. The approach is furthermore highly constrained: anti-faithfulness constraints are rigorously defined as negations of faithfulness constraints and ranked against the rest of a grammar’s constraint hierarchy, producing subtractive alternations dependent upon other grammatical principles, as we have seen. This comes to us at the cost of some loss of restrictiveness from a fully conservative OT, but, in the end, it is preferable for a theory of grammar to say *something* about a patternable natural language phenomenon—even with some questions unresolved—than it is to say *nothing*.

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### Notes

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<sup>1</sup> For an exhaustive compilation of truncative morphological phenomena of all sorts, the reader is directed to Weeda (1992).

<sup>2</sup> Koasati has a relatively simple segmental inventory: consonants /p, t, c, k, ʔ, b, f, ʃ, s, h, m, n, l, w, y/ and vowels /i, a, o/. *c* and *s* are palato-alveolar stop and fricative respectively. Note also that  $\acute{V}$  is not penultimate stress, but rather high pitch-accent, morphologically conditioned in all forms. I assume here, after Martin (1988), that vowel length under this pitch accent is some form of compensatory lengthening and ancillary to the matter at hand. Evidence that the truncation occurs independently of pitch accent placement and vowel lengthening in the plural may be seen in those forms in which a pluralizing suffix *-ci* occurs simultaneously with plural truncation: *nisáf-fi-n* > *nis■-lí:-ci-n*. Here pitch accent does not fall on the root at all, as lengthening of the suffix *-li* shows.

<sup>3</sup> Here and throughout this paper, the original site of each truncated segment will be denoted by “■”. Note that “■” shows the segmental difference between *surface* forms in all cases, not necessarily between the truncated form and an underlying representation.

<sup>4</sup> M&P argue that previously analyzed templatic effects in reduplication and truncation may be analyzed without reference to the template as a formal linguistic object—templatic effects should always be derivable from the ranking of otherwise necessary constraints in the grammar.

<sup>5</sup> We denote the plural morpheme as  $\emptyset_{PI}$  here and throughout the paper for ease of reference. The exact status of the morpheme, as a zero morpheme or morphosyntactic feature, is beyond the scope of the current work.

<sup>6</sup> Underlying [l] assimilates to any preceding [+labial] consonant; we will assume here that this distributional fact is the result of some high-ranked markedness constraint(s) and leave it at that.

<sup>7</sup> *-ci-* appears idiosyncratically in some forms, indicating repeated or extended action.

<sup>8</sup> Along with Martin (1988), Hardy & Montler (1988), Weeda (1992), Lombardi & McCarthy (1993), Broadwell (1993), and Anderson (199x).

<sup>9</sup> The *h*-grade is a process of internal change in Koasati best described as infixation, where *h* is infixated before the ultimate syllable of the root.

<sup>10</sup> Note also that, undominated, I-CONTIG would redundantly rule out candidate (e). This ranking is neither necessary nor advocated here, primarily because the ranking \*C OMPLEX » MAX-IO is independently justified in the language as we have seen and a ranking of I-C ONTIG » MAX-IO suggests that we might find a paucity of infixational morphology—such is not the case in Koasati, as shown by glottal infixation in the imperative, ex. /is-hica-to-/ → [ishi:cá?to-], and the *h*-grade, ex. /ficip-ka-n/ → [ficiphkan].

<sup>11</sup> Note two problems with this approach. One: we have yet to explain why the truncation is from the root rather than from the affix. McCarthy & Prince (1993a) propose the meta-constraint: R OOT-FAITH » AFFIX-FAITH, the generalization being that affixal material is universally less marked than root material. This universal seems to be at odds with the Koasati data. If ROOT-MAX is ranked above AFFIX-MAX, and —MAX is ranked above both, there should never be truncation of root material before truncation of affix material. Two: while anchoring and contiguity adequately capture the surface facts of Koasati, a factorial typology of their ranking produces a cross-linguistically unattested truncation pattern: constituent medial. Horwood (1999) considers these problems in greater detail.

<sup>12</sup> Hardy and Montler's (1988) analysis was of identical morphological alternations in Alabama, another Muskogean language, mutually intelligible with Koasati.

<sup>13</sup> The language formerly known as Papago. Note the following orthographic conventions relative to IPA: e = [i], ɸ = [d], c = [tʃ], s = [ʃ], j = [dʒ].

<sup>14</sup> To my knowledge, this constraint doesn't actually account for the full range of subtractive allomorphy in TO (e.g., *hu:pan* > *hu:p■*, *wakona-mid* > *wakona-m■*, *gagswua* > *gagswua*), and coronal-high sequences are elsewhere attested in the language, but numerous authors (Hale 1965, Hill & Zepeda 1992) agree that there is some phonological basis for the loss of final vowels in this context.

<sup>15</sup> Fitzgerald presents a single exception to this, *híwa* > *híw*.

## Toward a history of the inflectional future in Colville-Okanagan Salish

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**Introduction.** Southern Interior Salish languages have a canonical 'future' construction that differs significantly from its counterpart in Northern Interior Salish. In the Northern Interior Salish (NIS) languages--Thompson, Shuswap, Lillooet--'future' expressions are biclausal consisting of an auxiliary followed by a nominalized verb.<sup>1</sup> The Southern Interior Salish (SIS) languages--Colville-Okanagan, Moses-Columbia, Kalispel, Coeur d'Alene--use a prefix or clitic whose functions include but are not limited to 'future' meaning. In Colville-Okanagan (CvOk) Salish, the inflectional future marker is a prefix, *ks-*, which is formally cognate with the future markers in Moses-Columbia and Kalispel.<sup>2</sup> In this paper, I describe the form and function of CvOk *ks-* and compare it with cognates in the NIS languages. This comparison suggests that CvOk (and likely the SIS branch as a whole) innovated with respect to NIS. CvOk appears to have developed the inflectional future prefix from biclausal constructions of Proto-Interior Salish (PIS) in which cognates of *ks-* introduced subordinate clauses only. Evidence remains in modern CvOk of this subordinating function of *ks-* along side its main clause functions. Moreover, the modalities of the relevant NIS biclausal constructions are reflected in the modern functions of CvOk *ks-* in main and subordinate clauses.

1. **Main clause functions of CvOk *ks-*.** Bybee, Perkins, and Pagliuca (1994), Bybee and Fleischman (1995), and Bybee (1998) have described a phenomenon known as agent-oriented modality. With respect to the older literature on mood, agent-oriented modality is a modified subtype of deontic mood. Specifically, it includes the domain of social and internal conditions on agents such as obligation and ability (social conditions), and desire, intent, and root possibility (internal conditions). Languages as diverse as Basque and Cantonese use the same gram to express two or more agent-oriented modalities (Bybee et al 1994:189). In CvOk, at least three types of agent-oriented modality are associated with the prefix *ks-*. In main clauses, verbs with *ks-* express the condition of desire or intent, obligation, ability, or root possibility attributed to the agent of the proposition. These modalities are distinguishable from epistemic moods through which a speaker expresses his or her commitment to the truth of the proposition.<sup>3</sup> In examples (1)-(3) the desire or intent of the agent is indicated by *ks-*. (I use the gloss **fut** (= 'future') as a generic for all functions of *ks-*.)<sup>4</sup>

- (1) ...way' náxəmt̚ k<sup>w</sup><sub>i</sub>-ks-q<sup>w</sup>əlq<sup>w</sup>ílstəm  
 pt however 2sObj\_1sSub-fut-talk(tr)  
 "...but (first) I want to talk to you." GW636
- (2) cúš-əlx: way' uł "əlʔíw k<sup>w</sup><sub>y</sub>lmíx<sup>w</sup>əm  
 say-3pSub pt pt father 2sSub\_chief  
 They said: "Father, you are the chief,  
 uł ks-m'áyaʔt̚-s-t iʔ sck'əłpáʔx̣-tət  
 pt fut-tell-2sObj-1pSub art thinking-1pPoss  
 and we are going to tell you what we are thinking. GW4
- (3) t'əx<sup>w</sup> náxəmt̚ t<sub>an</sub>wíʔ λ'aʔnt-íx<sup>w</sup>,  
 indeed however emphatic\_2sPro fetch(tr)-2sSub  
 But **you** go after it,  
 lut k<sup>w</sup><sub>t</sub>'<sub>i</sub>-ks-x<sup>w</sup>íc'əłtəm  
 neg 2sObj\_indeed\_1sSub-fut-give(tr)  
 I'm not going to hand it to you. GW289 (cf. 293 and 353)

Examples (4)-(5) show that *ks-* signals that the agent is under an obligation to perform an act. Note that these examples do not have the form of CvOk positive imperatives, whose markers are suffixal.

- (4) way' a-ks-k<sup>w</sup>úł'm a-sq<sup>w</sup>əsq<sup>w</sup>síʔ  
 pt 2Sub-fut-work(tr) 2sPoss-child  
 You should work with your child  
 t̚ə s̘aʔx̘áʔs iʔ siwłk<sup>w</sup>  
 pt sacredness art water  
 about the sacredness of the water. EC15
- (5) uł ixíʔ nix<sup>w</sup> a-ks-tíx<sup>w</sup>m,  
 pt deic also 2sSub-fut-gather(tr)  
 ixíʔ nix<sup>w</sup> a-ks-txt'ám,  
 deic also 2sSub-fut-care\_for(tr)  
 You can gather this [food] also, take care of that too,

a-ks-ǰaʔǰʔám                      ixíʔ, lut      a-ks-k'wɪ'ʔtanm'úsm  
 2sSub-fut-respect(tr)      deic neg      2sSub-fut-squander(tr)  
 treat it with respect, don't squander it. EC18

Agent-oriented modality includes the expression of conditions of (circumstantial) ability and root possibility obtaining over the agent. CvOk *ks-* also signals this function on main clause predicates as shown in (6)-(7).

(6) lut    k<sup>w</sup>u\_t'ə                      ks-cənkcníkən'təm  
 neg    1pObj\_indeed              fut-overtake(tr)  
 Never will she overtake us. GW223

(7) cak<sup>w</sup> iwáʔ †      kt'áq'əxnəm  
 if      even pt      stretch  
 If even she stretched,

u†      lut      t'ə                      ks-k'əʔkíc-s  
 pt      neg      indeed              fut-reach(tr)-3sSub  
 she can't reach it. GW357

In addition to agent-modality of several types, *ks-* also serves to mark true 'future' meaning. Bybee *et al* (1994) observe that the essence of future meaning is a prediction, thus making it a mix of modal and temporal notions. It is possible to find 'pure' predictions uttered in contexts that disallow the modal interpretations of *ks-* in evidence elsewhere. Examples (8) and (9) are futures or predictions of this type.

(8) u†      lut      haʔ      a-ks-ənstíls                      n'ín'w'iʔ      k<sup>w</sup>u\_cmrim,  
 pt      neg      ques      2sSub-fut-think              if              1pSub\_marry  
 And won't you think if we marry,

mə†      taʔlíʔ                      k<sup>w</sup>\_cpaʔpaʔsínk  
 then      much                      2sSub\_feel\_bad  
 very much you will be sorry?      GW638

(9) cut      iʔ      scutx                      "k<sup>w</sup>u\_ks-ckícəntəm                      iʔ      kpíqc'aʔ  
 said      art      one\_said              1pObj\_fut-arrive(tr)              art      white\_ones  
 The one who said it said, "The white skinned ones will arrive among us.

ks-ckícxst-s                      iʔ      cnq'wəykn'álxqən  
 fut-bring(tr)-3Sub      art      black-horned cows  
 They will bring black-horned cows.

k<sup>w</sup>u\_ks-ʔíʔtəm iʔ stím'tət iʔ spəqíc'aʔ  
 1pObj\_fut-eat(tr) art stuff-1pPoss art white\_ones  
 The white skinned ones will eat (up) our food.

k<sup>w</sup>u\_ks-ʔíʔtəm k<sup>w</sup>u\_ks-tər'qxnmiʔtəm iʔ stəx<sup>w</sup>cəncútət  
 1pObj\_fut-eat(tr) 1pObj\_fut-trample(tr) art wild\_food-1pPoss  
 They are going to eat and trample the food that we would gather."EC27-8

In (9), in which the speaker is reporting a dream that foretells the (disastrous) arrival of the white man, the predictive function of *ks-* is uppermost.

The third main clause function of *ks-* is as part of a circumfix that marks the category 'immediate future'. In this construction, *ks-* is added to stems with the suffix (-*míx*)-*aʔx* to signal that an event is about to happen. The context of this construction usually reveals that the imminence of an event is its focus, rather than a prediction or agent-oriented modality. Example (12) in particular illustrates the phasal quality of 'immediate future'.

(10) ks-m'ayncút-aʔx-əlx axáʔ iʔ k<sup>w</sup>ək<sup>w</sup>r'ít i-skək<sup>o</sup>ákaʔ  
 fut-story\_tell-asp-3pSub deic art golden 1sPoss-bird(s)  
 They are going to tell a story these birds of mine. GW411

(11) qiʔt-x way' k<sup>w</sup>u\_ks-λ'əx<sup>w</sup>t-míxaʔx"  
 waken-Imp pt 1pSub\_fut-die-asp  
 "Wake up! We are going to die!" GW538

(12) cus iʔ q'sápiʔ ks-ənt'ək<sup>w</sup>t'ək<sup>w</sup>uʔsíken'-aʔx  
 said art long ago\_ones fut-travel\_towards\_noon-asp  
 As they said long ago, it was going towards noon. EC52

It is unlikely that the various functions of *ks-* in main clauses are mutually exclusive, despite their differences. Speakers seem able to exploit the functions of *ks-* to get aspectuo-modal interpretations as in (13).

(13) lut t'ə cmyst-ín,  
 neg indeed know(tr)-1sSub  
 I don't know anything

uʔ kn\_ks-m'iʔm'yaʔncút-aʔx  
 pt 1sSub\_fut-teach\_self-asp  
 but I would like to [start to] teach myself. GW122

2. **Subordinate clause functions of CvOk *ks-*.** In subordinate clauses, CvOk *ks-* serves two functions not observed in main clauses. First, *ks-* marks a predicate as a purposive complement, as exemplified in (14)-(16).

- (14) way' i?\_t\_xλ'ut                      miy-s                      sənt'əpt'páqs-əs  
 pt    art\_pt\_rock                      place(tr)-3sSub                      corners-3sPoss  
 Rocks he put on the corners

lut    i?\_t\_sniw't                      ks-níw'əntəm  
 neg   art\_pt\_wind                      fut-blow(tr)  
 (so) the wind won't blow it away.    GW283

- (15) k'ʰás-əlx,                      yaʰyáʰt                      i?\_l\_təmx<sup>w</sup>úlaʰx<sup>w</sup>  
 pray-3pSub                      all                      art\_on\_earth  
 They pray (to the salmon) on the whole earth,

lut    ks-tílx<sup>w</sup>i?-s-əlx                      i?\_ks-tx<sup>w</sup>cəncút-s-əlx  
 not   fut-difficult-asp-3pSub                      art\_fut-get\_food-asp-3pSub  
 so that it may not be difficult to get food

a?\_nsiwłk<sup>w</sup>                      ixíʰ  
 art\_in\_water                      deic  
 from the water.    EC21

- (16) uł    p\_cut                      ʰmínk-əmp                      p\_ks-k'<sup>w</sup>úl'-aʰx  
 pt    2pSub\_say                      desire-2pPoss                      2pSub-fut-make-asp  
 And you say you want to make

c'xił                      t\_snm'aʰm'áʰyaʰtn  
 be\_like                      pt\_school  
 something like a school

ks-m'aʰm'áyaʰnt-əp                      i?                      səcm'ílt-əmp  
 fut-teach(tr)-2pSub                      art                      children-2pPoss  
 for teaching your children.    EC211

Second, *ks-* in subordinate clauses marks the clausal complement of certain complement-taking predicates. I refer to this as the subjunctive function of *ks-*.<sup>5</sup> The predicates that require a subjunctive complement are of two types. The first is a psychological predicate typically expressing the experiencer subject's desire or fear with respect to the complement proposition. The common theme of such predicates is that they express an emotional attitude toward a

possible outcome. I do not have an exhaustive list of such 'desire/fear' predicates, but examples such as those in (17) and (18) are easily found.

- (17) uł ałí? s-ksk<sup>w</sup>əl't-míx in-kəwáp uł ałí?  
 pt pt asp-sweat-asp 1sPoss-horse pt pt  
 My horse was sweating and

**kn sk'int** † i-ks-ənk<sup>w</sup>a?cnúx<sup>w</sup> kəm' † i-ks-ənsł'íp  
 1sSub\_afraid pt 1sSub-fut-be\_late or pt 1sSub-fut-be\_lost  
 I'm afraid I'd be late, or that I'd get lost. GW516

- (18) lut t' **in-ǰmínk** † i-ks-síwstəmstəm  
 neg indeed 1sPoss-desire pt 1sSub-fut-water(tr)  
 I don't want to water him. GW66

- (19) uł **spu?ús-əmp** p\_ks-tək<sup>w</sup>tək<sup>w</sup>?út-a?x  
 and wish-2pPoss 2pSub\_fut-travel-asp  
 And your wish is to travel around. GW11

The second type of complement-taking predicate that requires a complement clause with *ks-* may be referred to as 'achievement' predicates. These predicates characterize the ability of the agent named in the main clause.

- (20) uł náǰəm† **tilx<sup>w</sup>-s**  
 pt however difficulty-3sPoss  
 ...but he couldn't

‡ə ks-ənma?ípi?-s i? sk'<sup>w</sup>íł'təm-s  
 pt fut-tell\_on-3sPoss art older\_brother-3sPoss  
 tell on his brothers. [i.e. 'It's hard for him to tell on his older brothers'.]  
 GW252

- (21) uł **kn\_təlx<sup>w</sup>míst** † i-ks-x<sup>w</sup>t'ílx  
 pt 1sSub\_struggle pt 1sPoss-fut-get\_up  
 and I can't lift myself up. [i.e. 'I find it difficult to get up'.]  
 GW484

- (22) way' lut **qłnú-s**  
 pt neg be\_able(tr)-3sSub  
 He couldn't even

‡ə ks-qáqcəlx-s axá? i? snkłc'a?sqáǰa?  
 pt fut-trot-3sPoss deic art horse  
 trot, the horse. [i.e. 'He is not able to trot, the horse'] GW480

- (23) **k'wín'-n'**            iʔ        swiʔnúmtx            i-ks-k'wúl'əm  
 try(tr)-1sSub        art        handsome\_one        1sSub-fut-make\_into
- t\_sw'ar'ák'xn  
 pt\_frog  
 I tried to turn the handsome one into a frog.    EC226

To summarize, the functional distribution of *ks-* in main and subordinate clauses is shown in (24).

|      |   |   |
|------|---|---|
| (24) | <u>Main clauses</u>                                   | <u>Subordinate clauses</u>  |
|      | agent-oriented modality<br>future<br>immediate future | agent-oriented modality<br>future<br>immediate future<br>purposive<br>subjunctive |

**3. Northern Interior Salish Cognates of CvOk *ks-*.** Cognate forms of CvOk *ks-* in Northern Interior Salish allow us to see into the history of the inflectional prefix. The comparative data show that the NIS languages utilize a complementizer proclitic *k* which introduces a subordinate verbal predicate prefixed with *s-*. Prefixal person marking, if any, occurs between *k* and *s-*. In Thompson, this *k* + *s-* complex introduces complements of 'desire/fear,' and 'achievement' predicates, as well as purposive complements.

- (25) λ'u(?)            ʔe        sx<sup>w</sup>'áwk<sup>w</sup>-s            k        s-ǰəkpst-és  
 pt                    pt        heart-3sPoss            k        s-find\_out(tr)-3sSub  
 And it was his desire to find out.    TL201

- (26) ǰ<sup>w</sup>óǰ<sup>w</sup>stm'-cm-s            k        n-s-nés  
 want(tr)-1sObj-3sSub        k        1sSub-s-go  
 He wants me to go.    Kroeber 1991:126

- (27) n'té            teʔ        u        ʔéyə †        c'əqʔéw†  
 give(Imp)        pt        to        here        pt        canoe  
 Bring the canoe over here

ʔe        k        n-s-ném'ix  
 pt        k        1sSub-s-occupy.  
 so that I can get on.    Thompson and Egesdal 1993:298

- (28) x<sup>w</sup>uy' xe? cúk<sup>w</sup>stm e scúw-kt  
 fut deic finish(tr)-indef.sub pt work-1pPoss  
 We're going to finish our work
- ʔe k eʔ-s-x<sup>w</sup>óst  
 pt k 2sSub-s-go\_home  
 [so that] you can go home. TL218

Thompson *k* + *s*- also occurs in all negated expressions, where the negated clause is subordinate to a negative predicate as in (29)-(30).

- (29) λ'u(?) ʔe stém e steʔe k stéʔəʔix-s  
 pt pt neg pt at\_all k stand\_up-3sSub  
 And he wasn't able to stand up. TL209
- (30) te téʔe k s-ǰəkst-és ...  
 neg pt k s-know(tr)-3Sub  
 They didn't know... Thompson and Egesdal 1993:296

Negative commands--expressing the obligation of an agent--are also biclausal and require *k* + *s*- following an inflected modal main predicate.

- (31) cúk<sup>w</sup> us xe(?) k s-k<sup>w</sup>én-x<sup>w</sup>  
 finish cjv near k s-take(tr)-2sSub  
 Don't you take that. TL209
- (32) cúk<sup>w</sup> us k eʔ-s-yuʔyuʔsxén  
 finish cjv k 2sSub-s-trip  
 Don't trip! TL168

Other data suggest that positive recommendations (but not positive commands) may also involve *k* + *s*-.

- (33) péyeʔ us λ'uʔ k s-cənt-éx<sup>w</sup>  
 one cjv pt k s-ring(tr)-2sSub  
 Ring it once! Kroeber 1991:127

In Shuswap, a set of complement types similar to those in Thompson is introduced by *k*- + *s*- or ʔ- + *s*-.<sup>6</sup> Complements to predicates of 'desire/fear' and 'achievement' types, introduced by ʔ- + *s*-, are exemplified in (34)-(37).



The cognate constructions in Lillooet differ in the shape of the complementizer, which is  $k^w$  rather than expected  $k$ .<sup>7</sup> However, a complex consisting of  $k^w + s-$  is required for complements of 'desire/fear' and negative obligation predicates.

- (42) swáts\_ka             $k^w$ \_s-λ'iq-s            ʔk<sup>w</sup>únsa             $k^w$ \_s-Bill  
 It-is-to-be-hoped     $k^w$ \_s-come            today            art\_s-Bill  
 I hope Bill will come today. LL187

- (43) cəsutá\_ka             $k^w$ \_s-ka-ʔac'x̣-s-án\_a  
 It-is-to-be-hoped     $k^w$ \_s-control-see(tr)-3sObj-1sSub\_control  
 I wish I could see it. LL187

- (44) x<sup>w</sup>ʔáz-as             $k^w$ \_s-q'wə́p-su  
 not-opt             $k^w$ \_s-get\_burnt-2sSub  
 Don't get burnt! LL152

- (45) x<sup>w</sup>ʔáz-as             $k^w$ \_s-cún-ax<sup>w</sup>  
 not-opt             $k^w$ \_s-tell(tr)-2sSub  
 Don't tell him! LL152

Expressions of achievement and ability are monoclausal in Lillooet and therefore do not involve  $k^w + s-$ . No data were available on purposive complements.

It should be noted that the functions of the 'complementizer +  $s-$ ' forms in Thompson (Th), Shuswap (Sh) and Lillooet (Li) serve functions other than those outlined above. However, there is sufficient formal and functional overlap to justify reconstructing a complementizer  $*k$  and verbal prefix  $*s-$  for PIS. Table 1. summarizes the complement types introduced by  $*k + *s-$  in the NIS languages and a more distant relative of CvOk, Bella Coola. Bella Coola (Be) shows a subordinate construction cognate with that in NIS.<sup>8</sup> This suggests that the subordinating role of  $*k + *s-$  (despite the different linear ordering) is quite old.<sup>9</sup>

Table 1. Complement types in Northern Interior Salish marked by PIS *\*k* + *\*s-* and Bella Coola *s-* + *ka-*.

| Complement Type        | Th | Sh | Li | Be |
|------------------------|----|----|----|----|
| desiderative           | +  | +  | +  | +  |
| obligative             | +  | +  | +  | -  |
| achievement            | ?  | +  | -  | +  |
| purposive              | +  | +  | ?  | +  |
| jussive                | +  | +  | +  | +  |
| negative               | +  | +  | +  | -  |
| propositional attitude | +  | +  | +  | +  |
| future                 | -  | -  | -  | -  |

Table 1. also reveals that PIS biclausal *\*k* + *\*s-* constructions include the expression of conditions of desire, obligation, and ability holding over an agent- i.e. agent-modality. Assuming that the subordinate uses of *\*k* + *\*s-* predate the main clauses uses, it appears that CvOk reinterpreted the complementizer *\*k* as a marker of agent-oriented modality which permitted the main clause use of *\*k* and its host, the nominalized verb. This reinterpretation would have been assisted by other developments in the SIS languages that more generally reduced biclausal NIS constructions to monoclausal ones.<sup>10</sup> Ultimately, *\*k* lost its status as a clitic and fused to the *\*s-* prefix to form the CvOk prefix *ks-*.

As further evidence of the directionality of this development, consider how the order of the relevant elements reveals the source of CvOk *ks-*. Table 2. gives the order of *\*k*, *\*s-* and person marking (PM) in the cognate Interior Salish constructions.

Table 2. Reflexes of PIS *\*k* + *\*s-* and the placement of person markers (PM).

|     |      |       |       |       |        |
|-----|------|-------|-------|-------|--------|
|     | Li   |       | $k^w$ |       | s-STEM |
| NIS | Th   |       | k     | (PM)- | s-STEM |
|     | Sh   |       | k-/ʔ- | (PM)- | s-STEM |
|     | CvOk | (PM)- | k-    |       | s-STEM |
| SIS | Cm   |       | k-    | (PM)- | s-STEM |
|     | Ka   | (PM)  | q-    |       | s-STEM |

Lillooet is the only language in Table 2. that does not have prefixal person markers. Of the SIS languages, only one has the order observed in NIS, Moses-Columbia (Cm). There is morphophonemic evidence, however, that CvOk and Kalispel (Ka) also once had the NIS order. This evidence comes from the fact that in all three SIS languages the relevant person marking prefix (e.g. CvOk *in-* '1sPoss' / *an-* '2sPoss') loses its *n* before *s*, whether it marks 'possessor' or

'subject'. Compare the CvOk forms in (47) and (48).

- (47)           in-citx<sup>w</sup>  
                  1sPoss-house  
                  my house
- (48)           i-sqltmix<sup>w</sup>  
                  1sPoss-husband  
                  my husband

As the nasal of the prefixal person marker is not present when it precedes *ks-* (but not any *k*), it has been suggested by Dale Kinkade (p.c. 1998) that the person marking prefix must have lost its nasal during a stage of the language when the nasal was adjacent to *s*, as it still is in modern Moses-Columbia. The fronted person marker in CvOk (and Kalispel) gives the result exemplified by CvOk data in (49), while the PIS order is reflected in the Moses-Columbia example in (50).

- (49)   lut    a-k-s-?ácqa?  
          neg   2sSub-k-s-go\_outside  
          Don't go outside!
- (50)   lut    k-i-s-?úcqa  
          neg   k-2sSub-s-go\_outside  
          Don't go outside!

Thus the linearization facts support the claim that the NIS subordinate constructions predate the CvOk main clause constructions.

Finally, further evidence that CvOk *ks-* developed from NIS *\*k + \*s-* comes from the fact that the NIS *\*k + \*s-* construction does not mark agent-oriented modality, 'future' or 'immediate future' in main clauses, as shown in Table 3.

Table 3. Main clause mood involving *\*k + \*s-* in NIS and Bella Coola.

|                  | Li  | Th | Sh | Be  | CvOk |
|------------------|-----|----|----|-----|------|
| Agent-modality   |     |    |    |     |      |
| Desire           | no  | no | no | no  | ks-  |
| Obligation       | —ka | no | no | no  | ks-  |
| Ability          | no  | no | no | no  | ks-  |
| Future           | —k† | no | no | ka- | ks-  |
| Immediate Future | no  | no | no | no  | ks-  |

Where formally similar markers do occur in the related languages, there are morphological, linearization, and functional discrepancies that point away from cognacy with CvOk *ks-*. Because there is no sign of 'future' use of *\*k + \*s-* in NIS in main or subordinate clauses, I conclude that CvOk and the SIS languages in general innovated in developing the future prefix and function from a subordinating construction that expressed agent-oriented modality. Because the 'immediate future' function is more aspectual than modal, it is likely that it developed after *ks-* had acquired its 'future' function. As Bybee *et al* (1994) argue that this course of development--from agent-oriented modality into 'future' meaning and then into 'immediate future'--is a unidirectional one, the claim that CvOk innovated with respect to Proto-Interior Salish is further supported by evidence from an important cross-linguistic survey.

### Notes

1. Most Salishanists refer to a verb form with the pan-Salishan prefix *s-* and subordinate or 'nominal' person-marking as a 'nominalized' verb. The label is chiefly a shorthand for the form rather than the syntactic status of such verbs.
2. Coeur d'Alene has a clitic *čət* 'future' that does not appear to be cognate with CvOk *ks-*. Its relationship to Proto-Interior Salish is an important piece of the historical puzzle that I am not addressing here.
3. Epistemic modality is expressed with non-inflecting particles in CvOk.
4. Other abbreviations in glosses are as follows: pt=particle; s=singular; Obj=object; Sub=subject; tr=transitive; p=plural; art=article; Pro=pronoun; neg=negative; Poss=possessor; deic=deictic; ques=question; Imp=imperative; asp=aspect; indef.sub=indefinite subject; cjv=conjunctive; Excl=exclusive; opt=optative. The abbreviations for data sources are as follows: GW=Mattina (1985); EC=Okanagan Language Project (1994); TL=Thompson and Thompson (1992); SL=Kuipers (1974); LL=van Eijk (1997).
5. I use 'subjunctive' here to mean subordinate moods other than purposive. It is not clear to me yet if we can or need to be more specific for CvOk.
6. There is no regular correspondence between CvOk *k* and Shuswap *ʔ*, so the presence of Shuswap complementizers *k* and *ʔ* raises questions about what happened to *ʔ* in CvOk and other SIS languages. The present comparison only reveals that they are *functionally* identical in some contexts.
7. Kroeber (1991) suggests that this unexpected rounding may reflect the influence of Coast Salish languages on Lillooet rather than the PIS shape of the complementizer.

8. I consulted Davis and Saunders (1980) and (1997), Nater (1984), Newman (1976), and Kroeber (1991) to draw the preliminary conclusion that Be *s-* + *ka* is cognate with NIS *k* + *s-*.

9. An intriguing difference between Be *ka-* and PIS *\*k* is that it is not restricted to subordinate clauses. However, judging from Be texts, *ka-* marks epistemic moods (e.g. 'probable', 'conditional') and not agent-oriented modality. Furthermore, *ka-* does not co-occur with *s-* in main clauses although it does in subordinate clauses. If Be *ka-* represents the Proto-Salish pattern, then its functions are much reduced in Interior Salish. A full study of these questions is in progress.

10. For example, SIS languages as a group have lost conjunctive inflection on negative and obligation predicates so that the uninflected negative element is synchronically analyzable as a particle rather than as a predicate. Compare the monoclausal CvOk negative command in (i) with the biclausal negative commands of Thompson (31), Shuswap (40), and Lillooet (45).

- (i) lut a-k-s-ǰlítm  
 neg 2sSub-k-s-call(tr)  
 Don't call him!

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## Classificatory verbs of motion in Lowland Chontal<sup>1</sup>

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Lowland Chontal of Oaxaca, an indigenous language of Mexico usually grouped in the proposed Hokan stock, has a series of derived stems composed of a lexical prefix and a verb of motion. The events predicated describe movement of a semantic THEME, whether as intransitive subject or transitive object. When the prefix is a classifier, it evokes some aspect of the THEME, GOAL, or other semantic role present in the scene to describe the manner of handling or situating the moved entity, as in 'move like a small thing, move to a flat place'. When the prefix is another verb, it qualifies the type of motion, as in 'put in by dropping', or predicates a compound motion event, as in 'hit the surface and put in'.

In these motion events, a THEME moves along a PATH to a GOAL, sometimes through a specified AGENT. The element of PATH is conflated in the verbal root, which describes motion up, up onto, down, down from, into, away from, or toward. Examples of the manipulation of 'corn' translate roughly as '*corn-put* the corn into the gourd', which evokes the THEME itself; '*small.thing-receive* the ears of corn', which evokes the size of the THEME; '*container-put* the corn into the pot', which evokes qualities of the GOAL, and '*fall-put* the corn', which qualifies the motion as 'trickle'. Any of the semantic roles of AGENT, THEME, or GOAL can be the grammatical subject of the clause. This complex of features resembles patterns in North American languages described as verbal morphology of gender or manner (Mithun 1989) and as what Jacobsen (1980) and DeLancey (1996a, 1996b, 1999) call "bipartite stems" used in predications of motion, location, attribution, and change of state in other languages posited as Hokan and Penutian.

In this paper I describe the basic derivational pattern of classificatory verbs in Lowland Chontal (hereafter Chontal) with a few examples of combinatorial possibilities of lexical prefixes and motion verbs that compose the derived stems. I illustrate functional interactions of the stem elements with two series of examples. The first set presents expressions in which the same THEME referent is in motion, in constructions with different prefixes and verbs. A second series of examples focuses on a single motion root, with different prefixes and THEME referents. The analysis highlights the importance of clarifying the parameters of the motion itself and determining how the prefix contributes to qualify the motion event. Morphological, semantic, and syntactic patterns found in Chontal are compared to patterns of classificatory and instrumental prefixes and bipartite stem constructions identified in other languages, and I conclude that a convincing description of these derived stem constructions in Chontal requires an examination of their usage in context.

### 1. The language.

Chontal is a head-marking language with an agent-patient morphosyntactic system and basic VSO word order. Grammatical relations of subject and object are distinguished. Evidence for subject includes number agreement in aspectual morphology, the presence of obligatory pronouns for first and second persons in agentively marked constructions, and

obligatory pronominal affixes for all but third person singular in non-agentively marked constructions (see Table 1).

|                 | AGT  |        | PAT |        |
|-----------------|------|--------|-----|--------|
|                 | SG   | PL     | SG  | PL     |
| 1 <sup>st</sup> | iya' | iyank' | jl- | -onga' |
| 2 <sup>nd</sup> | ima' | imank' | -o' | -olwa' |
| 3 <sup>rd</sup> | 0    | 0      | 0   | -ola'  |

**Table 1: Person marking in Lowland Chontal**

Some objects are marked on the verb, using the non-agentive (PAT) series of affixes. While the pattern suggests that Chontal is a primary object language (Dryer 1986), further analysis is needed to determine the precise character of the object system.

## 2. Morphology of classificatory verb stems.

Classificatory verbs of motion in Chontal are composed of two elements: a lexical prefix and a verb of motion. To the extent that the combinatorial possibilities of prefixes and verbs are presently understood, each component is discussed below, starting with the motion verb.

### 2.1. The motion verb.

Motion verbs identified as participating in these derivations translate as *give, receive or divide, lift, put in, put up on, fetch or gather, take, remove, take down, and lower*. I discuss a subset of these with a variety of lexical prefixes. Waterhouse (1962:74-75) calls these elements "adjuncts to action of verb", but my analysis shows that they are sometimes the only candidate for verb root in the clause and that some occur unprefixes. The data presented in this paper include the following, listed with common English gloss and with a basic motion definition.

|      |                   |                 |
|------|-------------------|-----------------|
| ay-  | 'give'            | [ move across ] |
| f'-  | 'raise'           | [ move up ]     |
| fi-  | 'put up on'       | [ move up on ]  |
| 'mi- | 'put in'          | [ move in ]     |
| ñi-  | 'receive, divide' | [ move across ] |

At this early stage of analysis, I find the basic definitions helpful in minimizing the bias of Spanish and English translations as I sort through the effects of various verbal and classifier prefixes on each verb of transfer.<sup>2</sup>

Derived stem constructions can also be nominalized, although the productivity of this process has not been explored thoroughly.

- (1) **oy**            **-f'**    **-a**  
 CLF:flat-raise-NMZR  
 'roof'
- (2) **l-aw'ay**        **-f'**    **-a**  
 DET-children-raise-NMZR  
 'the seedlings'

In (1), the sense is of something which has been raised to a flat place, or possibly of a flat thing which has been moved up. In contrast, the noun in (2) is different formally, in that the motion verb is affixed to a common noun to describe 'small things' which have come up, or sprouted.

## 2.2. The lexical prefix.

The lexical prefix can be a classifier or another verb, and the prefix can be polymorphemic.

CLASSIFIER PREFIX: Classifier prefixes in Chontal typically evoke a semantic quality of the THEME, such as shape or size; a quality of the GOAL; or the THEME itself. Their general function is to qualify the 'basic motion' of the verb root, specifying how the THEME is handled. Some classifiers can be traced with relative confidence to nouns of origin, e.g. *kay*- 'basket like' from *akayxma* 'basket', and *pi*- 'small (and maybe round) thing' from *apij* 'stone, rock', where others cannot. Examples (3-5) show various possibilities with the verb root *f'*-, 'move up, raise'.

- (3) **kay**                    **-f'**    **-'la l -alewa'**  
 CLF:basket.like-raise-IMPV DET-wooden.bowl  
 'pick up the bowl'
- (4) **le**                      **-f'**    **-'la l -ityankwi'**  
 CLF:long.thin-raise-IMPV DET-hay  
 'pick up the hay'
- (5) **wa**                      **-f'**    **-'la l -pime**  
 CLF:container-raise-IMPV DET-plate  
 'pick up the plate'

Note that the prefix *le*- 'long, thin' in (4) is used for people, except in the case of babies and small children, which are handled like 'small, round things', with the prefix *pi*-. Interestingly, the derived stem for the delivery of newborns uses *le*-, as described in note 2 and illustrated in (20), reflecting the different way of handling the child's body.

VERBAL PREFIX: Many verbs which occur as lexical prefixes occur as independent, inflecting verbs in the language, while the etymologies of others are not so transparent. There are at least three ways in which a verbal lexical prefix seems to classify the motion: 1) as a sequence of actions, 2) as a specific manner of motion, or 3) motion for a specific purpose. These are illustrated in (6).

- (6)
- |    |            |         |              |               |   |                             |
|----|------------|---------|--------------|---------------|---|-----------------------------|
| a. | <i>na-</i> | 'hit'   | + <i>f-</i>  | 'move up'     | → | 'come to water's surface'   |
| b. | <i>ka-</i> | 'leave' | + <i>ñi-</i> | 'move across' | → | 'get lost'                  |
| c. | <i>te-</i> | 'fall'  | + <i>mi-</i> | 'move in'     | → | 'trickle'                   |
| d. | <i>sa-</i> | 'eat'   | + <i>mi-</i> | 'move in'     | → | 'feed, maintain the family' |

In (6a) the motion can be understood as 'hit the water and then move up', while in (b), the sequence is 'move away and then leave (it there)'. Alternatively, the prefix in (a) might be understood as a type of instrumental, 'move (self) by hitting (water)', which seems to be the case with (c) 'move (seeds) by falling (dropping them)'. In (d), the compound verb implies the purpose of the motion, as in the comparable English idiom, 'put food on the table'. The verbal prefix does not predict transitivity: in my corpus, (a) occurs in an intransitive clause; (b) is intransitive but may be further derived to predicate a transitive event (exx. 16, 17); (c) is used transitively; and (d) is transitive.

**POLYMORPHEMIC PREFIX:** The lexical prefix can be polymorphemic, as in (7). Making tortillas involves flattening balls of dough between the outstretched palms and fingers and then tossing the flattened dough to cook in a wide, shallow pan.

- (7) **Na -ng**      **-mi**      *-pa sa =iya' l -ay -ñ -a'wa-skujl'*  
 hit-surface-put.in-PFV DEM=1S      DET-1sPOS-LNKR-DIM -tortilla  
 'I patted and tossed my little tortillas (onto the pan).'

The derived stem here describes the entire sequence, 'hit the surface and put in'.

### 3. Interacting functions of elements.

In this section I examine the interaction of lexical prefix and motion verb root, approaching the analysis from what Levinson (1996:190) has called the "ontological commitment" of the language. What type of motion is encoded by the verb? What refinement does the lexical prefix contribute, and how does it relate to semantic participants in the event frame? Which aspects of motion must be encoded, and which can be omitted or understood? To begin shaping the answers for Chontal, I present three groups of utterances involving motion of the same or similar THEME referents in derived stem constructions with different lexical prefixes.

#### 3.1. Contributions of the lexical prefix.

**'BREAD' AS THE THEME IN MOTION:** In the following examples, classifier prefixes describe the manner in which the THEME referent is moved or reduce the ambiguity of the reference.<sup>3</sup> In (8), a semantic quality is evoked, to describe 'giving bread like a small thing', as a loaf in the hands.

- (8) **Jl -p**                      **-ay**      *-pa ima' l -ay -n -a'i*  
 1sPAT-CLF:small-give-PFV 2S      DET-1sPOS-LNKR-bread  
 'You gave me bread.'

In (9), the bread is 'moved in or into a container' at the seller's post.

- (9) *Tyi=pe sa =ima' wa-s -'mi -'ma l -a'i*  
 DEM=LOC DEM=2S CLF:container-put.in-IMPF DET-bread  
 'There you will set out the bread (in the marketplace).'

The classifier prefix in (10) is in fact the word for 'bread'.

- (10) *'i -ñi -yuy sa =iya' l -a 'wa-s'e*  
 CLF:bread-receive-DUR DEM=1S DET-DIM -tortilla.dough  
 'receiving the stiff, cornmeal dough,'

The data in (8-10) show that the variety of prefixes distinguishes the handling of the THEME. As in (8), the seller in (9) is also moving loaves, yet in the latter example the classifier evokes a 'container', describing either the mode of transportation or evoking a possible GOAL referent. In (10), the classifier clarifies the type of *as'e* 'tortilla dough'. This noun translates into Spanish both as *masa* 'dough' and *atole* 'corn drink'. In a motion event involving *as'e* of the liquid variety, the classifier used is *wa-* 'container'.

'MONEY' AS THE THEME IN MOTION: In the running text in (11), the movement of money is classified according to the size of the currency, the manner in which it is handled, or the endpoint of the motion.

- (11)
- a. *Joypa pi -ñi -wa sa =ima' l -akwe'-melyu'*  
 already CLF:small-receive-CONT DEM=2S DET-man -money
- b. *puro pesetas sa =ima' pi -ñi -yuy puro plata.*  
 (all pesetas) DEM=2S CLF:small-receive-DUR (all silver)
- c. *Sk'wi-'mi -'ma ima' fa'a l -o -ku'u o sa =ima'*  
 tuck?-put.in-IMPF 2S here DET-2sPOS-belly or DEM=2S
- d. *wa-jl -'mi -'ma jaape l -o -n -a'wa-bolsa.*  
 CLF:container-put.in-IMPF where DET-2sPOS-LNKR-DIM -(purse)
- e. *Wa-s -'mi -'ma sa =ima' l -o -melyu.*  
 CLF:container-put.in-IMPF DEM=2S DET-2sPOS-money

'Now you're getting lots of money, all coins you're receiving, all silver. You put it here (in the belt) on your belly, or you put it in your little purse. You put your money in it.'

In (11a, b), lexical prefixes evoke the size of the THEME. In contrast, the prefix in (c) classifies the type of action in an instrumental sense, and in (d, e) the prefix classifies the GOAL. The clause in (e) is particularly interesting in that the lexical NP is 'money', but the prefix evokes the 'purse' mentioned in the previous clause.

'POLES, BARS, and THATCH' AS THEMES IN MOTION: Classifier prefixes also evoke a quality of the GOAL referent, either to qualify the manner of moving the THEME or to signal the orientation of the THEME during the motion event. This function is illustrated in (12), a short text with three examples in which the orientation rather than the long, thin quality of the THEME is evoked by the lexical prefix of the classificatory motion verb.

(12)

- a. *Ly -i -munlye' son los horcones.*  
 DET-3sPOS-support.beams (are the cornerposts)
- b. *Pu -pa' sa l -iwa' kas -'mi -p -ola' sa*  
 dig-PFV.PL DEM DET-holes stand.up-put.in-PFV-3pPAT DEM  
*ly -i -munlye'*  
 DET-3sPOS-support.beams
- c. *para sa kas -pa.*  
 (so that) DEM stand.up-PFV
- d. *Oy -f'i -pa' sa lan -bara'*  
 CLF:flat-put.up.on-PFV.PL DEM DET.PL-(bars)
- e. *Pase -yo -pa sa =iya' kon jasa*  
 do/make-CAUS-PFV DEM=1S (with) thatch
- f. *oy -f'i -pa' sa lan -jasa -k'.*  
 CLF:flat-put.up.on-PFV.PL DEM DET.PL-thatch -PL

(*speaker is teaching vocabulary of the house and patio*) 'The "cornerposts" are the cornerposts. They dug the holes and stood the support beams in place, in order to stand it up (the frame of the patio). They put the bars on top. I had it made with thatch, (and so) they put thatch on top.'

The derived stem in (12b) demonstrates the importance of specifying the orientation of the THEME, as the workers dug the holes and then put in the beams, (the beams) standing upright. The construction also represents a sequence of actions, as 'stand up the beams and put them in' the holes.

In (12d, f), the workers grasped and lifted bars and handfuls of thatch – yet the expected prefix *le-* 'long, thin' is not used. Instead, the salient aspect of the motion is the final position of the materials, which determines the prefix of the derived construction. Chontal is like English in this respect: recall the noun for roof, *oyf'a*, from (1). In English we would say, "they roofed the patio with bars and then thatch" to express that they raised bars and thatch and moved them horizontally to make a roof.

The examples in this section illustrate the diversity of the semantic relationships of lexical prefix and motion stem in Chontal. In a general sense, classifier prefixes are not anaphoric or referential but instead qualify or specify the basic motion (Mithun 1984, 1989). However, a full explanation in Chontal may be more complex. Future discourse analysis will clarify the functions of the prefix in reducing ambiguity, as in (10); maintaining an unspecified or backgrounded referent in the event frame, as in (11e); or in signaling the orientation of the object in motion, as in (12).

### 3.2. Contributions of the motion verb: *ñi-* 'move across'.

In this section I address the nature of the motion encoded in a verbal root, comparing utterances with *ñi-* 'receive, divide' or simply MOVE ACROSS. By looking at a single

verb, unglossed in the examples, the motion element is held relatively constant in order to highlight the permutations of event participants and lexical prefixes. In each example a semantic THEME ‘moves across’, sometimes to a specified semantic GOAL, and sometimes through an external AGENT. The data show that any of these semantic roles can be realized as grammatical subject. The lexical prefix can evoke the THEME, the GOAL, or some other participant present in the scene but not included in the argument structure of the verb. Alternatively, it can narrow the scope of the action in a compound verb construction.

The first example shows an unprefixated occurrence of the verbal root *ñi-* as simply ‘receive’ or ‘earn’. Here both THEME and GOAL are realized, and the GOAL is the subject.

- THEME GOAL  
 (13) "Tes ima' *ñi*-yuy?" kwa.  
 what 2S ñi-DUR say  
 'How much are you earning?' he said.'

In (14) both THEME and GOAL are realized and the GOAL is the subject, as in (13), but here the GOAL is a location.

- GOAL THEME  
 (14) Tamagay jaape *pi* -*ñoj* -'ma el texa  
 above where CLF:small-ñi:DSTRB-IMPF (the) tile  
 'On top, where it's going to receive the tiles,

The prefix in (14) classifies the size of the THEME and not the flatness of the GOAL, in contrast to (1) and (11).

In (15) the derived motion is clearly not related to ‘receive’ but rather something like ‘move across and away’.

- AGENT THEME  
 (15) *Ski* -*ñi*- 'ma sa =iya' l -a'wa-tyu'  
 chop?-ñi-IMPF DEM=1S DET-DIM -fish  
 'I'm going to chop up the little fish'

Both AGENT and THEME are realized in (15), and the AGENT is the subject.

The example in (16) illustrates a compound verb construction marked as transitive.

- AGENT THEME  
 (16) *Ka* -' -*ñi*-pa iya' l -ay -'wa  
 leave-TVZR-ñi-PFV 1S DET-1sPOS-child  
 'I lost my daughter.'

In (16), both AGENT and THEME are realized, and the AGENT (subject) ‘moved and left’ or ‘lost’ her daughter.

The near minimal pair utterance in (17) has a realized THEME and the same verb compound, not marked as transitive.



- j. *joypa sa =ima' ch'ujk'oy-'ma l -ijeda*  
 already DEM=2S enter -IMPF DET-town
- k. *Juuuu,*  
 Hoo boy,
- l. *tonj k -a'wa ayñofajl l -ane'*  
 like EPEN-DIM snake DET-road

'So now you head off again on foot, because it's still a long way to get to Piña. Now you have crossed the Piña bridge, you caught the road, you went (along). First you come across the cemetery, where the spring is ... and you go find the mountain. Once you have reached the mountain, then you will enter the town. Hoo boy, the road is like a little snake!'

In (19c), the 'cross water' derived construction previously discussed in (18) occurs in a clause without an overt mention of 'water'. I suggest that the sequence in (19c) is a lexicalization, positing that *kiñi-* originated as 'move across by wading through water' which grammaticized as 'move across water' whether the walker is physically wading or not. The semantics are less clear in (19d,i). In (d), in what way could motion across (to) a road be considered like moving across (to) a container? In (i), are you receiving the highlands as though you were a small thing, or are you reaching a 'rocky place', a literal interpretation of the prefix *pi-* from its likely source of origin, *apij* 'rock, stone'? How does either one of these prefixes qualify the action?

The examples below indicate that classificatory verbs of transfer are also used in metaphorical expressions. The grammatical subject 'takes on' a job in (20), and 'receives' the new year in (21) – both expressed with *ñi-* 'MOVE ACROSS' and the lexical prefix *wa-*, which usually refers to a 'container' quality.

- (20) *Piñik'-a'wa sa =iya' wa -ñom -pa,*  
 job -DIM DEM=1S CLF:container-receive:ITR-PFV
- le -f' -k -ilya' iya=sa l -a'wa-y'*  
 CLF:long.thin-raise-DUR-3pPAT 1S =DEM DET-DIM -PL

'I took on another little job, delivering babies (acting as midwife).'

- (21) *Wa -ñi -pa' joypa tyuwa amats'.*  
 CLF:container-receive-PFV.PL now other year  
 'We have received another year. (Happy new year!).'

The possibilities of metaphorical extension remain a topic of future investigation.

#### 4. Discussion.

The patterns of derivation in classificatory verbs of motion in Chontal generally resemble those described in several North American languages. Mithun (1989) illustrates

gender and instrumental verbal categories specified in Haida, Cayuga, Takelma, Cheyenne, and Central Pomo, languages which like Chontal are characterized by complexity in verbal rather than nominal morphology. The forms and functions of classifier type lexical prefixes in Chontal are consonant with those identified as types III and IV noun incorporation in Mithun (1984) in such language groups as Northern Iroquoian and Caddoan. In type III, incorporation narrows the scope of the verb and reduces the salience of the nominal in discourse, and in type IV the incorporated noun has grammaticized to a classificatory prefix which qualifies the verb. In neither type are the incorporated nouns referential, in that they are not used to establish new, topical referents in discourse and most often occur in clauses which contain independent nominals. While Chontal fits this description in the main, I have also presented examples in which the lexical prefix may index a quality of a nominal more directly than it qualifies the verb.

Are these Chontal derived stems "bipartite stems", as defined in the literature? Not exactly, but many of the verbal constructions in this paper bear resemblance to Jacobsen's (1980) type I bipartite stems in Washo, composed of a lexical prefix evoking 'the thing in motion' and a dependent verb stem of motion. Jacobsen finds that both parts of the bipartite stem are bound (only six of the 200 identified verb stems in Washo can occur alone) and that the lexical prefix determines the transitivity of the derived stem. Neither of these is true for Chontal, although the numbers of identified prefixes and stems is much lower. For example, of the dozen stems identified so far, two can occur unprefixes, a much larger proportion. Jacobsen also reports only a reduplicative plural morpheme occurring between prefix and stem (1980:86), which is not the case in Chontal.

Chontal derived stems are also similar to two of DeLancey's (1999) types of bipartite stems in Klamath. In DeLancey's explanation, one type of bipartite stem is composed of a lexical prefix that classifies some semantic feature of the semantic THEME and a locative-directive stem. The classificatory prefix describes what is moving and/or the way in which it is manipulated, and transitivity of the derived stem varies. Both those statements hold for Chontal. He also describes another type of bipartite stem composed of a motional lexical prefix which specifies the manner of a locative-directive stem, but in Klamath the derived motion verb is always intransitive.

Future work on grammaticization of classificatory stems in Chontal, comparison with the highland dialect and with neighboring languages in Oaxaca, and a clearer understanding of lexicalization of derived stems will shed more light on the character of classificatory and verbal prefixes with verbs of motion.

## 5. Conclusions.

This paper has sketched the outlines of a pattern of verbal morphology in Lowland Chontal of Oaxaca in which a lexical prefix qualifies or further specifies a motion verb root. The verb root conflates an element of PATH, depicting motion up, down, across, in, onto and down from. When the prefix is a classifier, it evokes an attribute of the THEME, of the GOAL, of some other semantic participant, of the THEME itself, or a semantic quality identified by metaphoric extension. When the prefix is a verb, it specifies the manner of the motion in an instrumental sense or presents the motion as a sequence of actions. The

derived stem can predicate a transitive or an intransitive event, and the AGENT, THEME, or GOAL can occur as grammatical subject.

A major function of verbal classificatory prefixes, in Chontal and in many North American languages, is to distinguish how the THEME is manipulated in transitive motion events or precisely how the THEME moves in intransitive motion events. Analysis and examples presented here indicate that speakers make nuanced selections among possible prefixes for motivations not fully understood. The data suggest that a complete description of sometimes subtle differences in prefix-stem interactions must begin with an understanding of the ontological commitment of the language and will be best discovered by looking at utterances in their local discourse context.

### Notes

Only data pertinent to the discussion are fully glossed. Spanish borrowings are glossed inside parentheses. Abbreviations used in this paper are: 1S-3P = person markers; CAUS = causative; CLF = classifier; CONT = continuative; DEM = demonstrative; DET = determiner; DIM = diminutive; DSTRB = distributive; DUR = durative; EPEN = epenthetic; IMPF = imperfective; ITR = iterative; LNKR = linker; LOC = locative; NMZR = nominalizer; PAT = non-agentive; PFT = perfect; PFV = perfective; PL = plural; POS = possessor; SG = singular; TVZR = transitivizer; and at morpheme boundary, hyphen = derivation OR inflection and equal sign = clitic.

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1 Chontal of Oaxaca is a Mexican indigenous language spoken in the southern part of the state of Oaxaca. There are two major dialects – Highland Chontal, of the mountain area, and Lowland Chontal, on the Pacific coast. According to the 1990 census, there are about 15,000 ethnic Chontales; 3,500 of these reported themselves speakers of the highland dialect, and another 1,000 as speakers of the lowland dialect. However, the speakers tell me there are about 250 truly fluent speakers of Lowland Chontal, all elders. There is currently an active program in revitalization, mostly through the work of the Indigenous National Institute and the bilingual education community. The data were collected during fieldwork in San Pedro Huamelula, Oaxaca, November 1997 – March 1998, and I consulted work by the late Viola Waterhouse. I am grateful to the Chontal speakers who shared their language with me; in particular, I thank Adelaida Espinoza Raymundo, Eulalia Espinoza Raymundo, and Petrona García Sosa for the examples and insights used here. This paper was improved by comments at WAIL-2, and I am grateful to Violet Bianco for editing the final version.

2 I first noticed these verbs because the Chontal first-language speakers in Huamelula used Spanish verbs in unusual ways. In describing her life, one of my consultants told me, “*Tambien levanto criatura*,” which to me meant, “And I also pick up children.” Further conversation clarified: she is a midwife.

3 Here *p-* and *wa-s/wa-ɟl* are allomorphs of *pi-* and *wa-*, respectively.

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# The semantics of voice in Yaitepec Chatino -*ʔoʔ*

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## 0. Introduction

The morpheme *ʔoʔ* ‘with, and’<sup>2</sup> in Yaitepec Chatino has several related functions. This paper focuses on a construction in which *-ʔoʔ* is incorporated into a verb stem. When the incorporating root is intransitive, the resulting transitive stem denotes an event in which the participant coded by the subject and that coded by the direct object are involved with partially similar semantic roles. When the incorporating root is transitive, the resulting stem denotes an event in which the participant denoted by the subject is an agent and that denoted by the direct object is a patient. Additionally, it is understood that there is another participant, which may be mentioned in a prepositional phrase or may be unmentioned, with a semantic role similar to that of the direct object.

I refer to the incorporation of *ʔoʔ* as an ‘applicative’ construction in the general sense of a non-causative transitivity-increasing construction, in which a noun that would appear in a prepositional phrase in a clause without the applicative morpheme appears instead as a direct object (Garrett 1990, Watters 1996, Payne 1997). Because the participant whose presence in the clause is indicated by the incorporated form has a semantic role similar to that of the patient subject of an intransitive verb or the direct object of a transitive verb, the applicative *ʔoʔ* construction formally indicates a patientive category. I propose in this paper that the emergence of this formal category is epiphenomenal to the general semantic consequence of the incorporation of *ʔoʔ*, that is, the inclusion, as a core argument, of a participant that is semantically peripheral to the event.

This paper is organized as follows. In Section 1, I discuss non-applicative uses of *ʔoʔ*, as a conjunction and as a preposition. Section 2 describes the effect of incorporation of *-ʔoʔ* into stems with various classes of verb roots. In Section 3, I show how the notion of voice as discussed in Davis and Saunders (1989) accounts for the meanings of constructions with incorporated *-ʔoʔ* and simultaneously accounts for the emergence of a patientive category in such constructions.

## 1. Non-applicative uses of *ʔoʔ*

In this section I summarize the three non-applicative functions of *ʔoʔ*. These uses of the morpheme represent the probable source of the grammaticalization of applicative *ʔoʔ*, and their semantics are evident to varying degrees in the applicative construction. However, their semantics contrast with those of the incorporated morpheme, and therefore they can serve as foils to illuminate the precise meaning of the incorporation construction.

*ʔoʔ* can be glossed ‘and,’ ‘also/too,’ or ‘with’ (in both the instrumental and accompaniment senses of English ‘with’). When it conjoins elements, so that the phrase

including both conjoined elements and the conjunction itself acts as a unit with regard to the surrounding sentence,  $7o^1$  occurs between the conjoined elements:

- 1)  $nti^{32}-7\alpha^1$   $xa^{21}-nu^2$   $w\alpha^3$   $nw-7ni^{-1}$   $ka^2-na^{24}$   $7yan^{32}$   $7o^1$   $tnyi^{24}$   
 soon when already C-do-2sg win to.1sg and money  
 $7yan^{32}$   $in^2$   
 of.1sg DSC  
 ‘soon, when you have beaten me and (won) my money. . .’

In a distinct but related usage,  $7o^1$  means ‘with’:

- 2)  $n-kila^{12}$   $nu^2$   $cha^2-kwchi^{23}$   $7o^1$   $ska^{712}$   $7in^1$   $\emptyset$   $ra^4-ka7n^{43}$   
 C-arrive NOM rabbit with gourd of 3 then  
 ‘the rabbit arrived with his gourd then’
- 3)  $ska^2-ny7\alpha^{24}-ti^2$   $nty-ka^{24}-k7wi^{32}$   $\emptyset$   $7o^1$   $t7\alpha^{12}-nkwla^{32}$   $\emptyset$   $7o^1$   $sti^2$   $\emptyset$   
 only H-get-drunk 3 with brother/sister 3 and father 3  
 ‘he would get drunk with his brothers and father’

There is evidence suggesting that these two uses of  $7o^1$  should be kept distinct. For some examples, the position within the clause of a phrase with  $7o^1$  has clear consequences for the interpretation of the sentence, as the following pairs of examples illustrate:

- 4a)  $nw-ny\alpha^{24}$   $xwa^{32}$   $l7an^2$   $re^{34}$   $7o^1$   $tyu^{24}$   
 C-build John house this with Peter  
 ‘John built this house with Peter’
- b)  $nw-ny\alpha^{24}$   $xwa^{32}$   $7o^1$   $tyu^{24}$   $l7an^2$   $re^{34}$   
 C-build John and Peter house this  
 ‘John and Peter built this house’
- 5a)  $nt-7i^1-jy\alpha^{23}$   $xna^{24}$   $ni^{72}$   $y7an^1$   $7o^1$   $liy\alpha^{24}$   
 N-play Joana in house with Mary  
 ‘Joana is playing in the house with Mary’
- b)  $nt-7i^1-jy\alpha^{23}$   $xna^{24}$   $7o^1$   $liy\alpha^{24}$   $ni^{72}$   $y7an^1$   
 N-play Joana and Mary in house  
 ‘Joana and Mary are playing in the house’

In 4a, if we are told that one of the two people building the house is a supervisor and the other is the apprentice, the inference is that John is the supervisor. In 4b, there is no such inference. A difference between 5a and 5b is that there is a stronger implication in 5a that the two children are playing together. In 5b, they might be merely playing in the same general location.

$7o^1$  can also be used to include the referent following it in some event that has been previously mentioned. The following example occurs in a context in which the protagonist of the story, a rabbit, has observed that the bull is a large animal:

- 6)  $7o$   $n^1$   $a7n^3$   $nty-ka^{24}$   $-ti7$   $n^{32}$   $k-lu$   $n^{32}$   $jwin^2$   $mu^2$   $kwchi^{23}$   
 with 1sg 1sg N-want 1sg P-grow 1sg said NOM rabbit  
 'I too want to grow, said the rabbit'

In example 6, the 1<sup>st</sup> person pronoun marked by  $7o^1$  is focused on to the exclusion of any mention of the other entities that have been described, in the preceding discourse, as being very large. The 1<sup>st</sup> person pronoun marked by  $7o^1$  is not oblique in this example; it instead corresponds to the subject of the clause. This use of  $7o^1$ , which may be glossed by 'too' in English, is more closely related to the use glossed 'and' than to that glossed 'with'—the participant marked by  $7o^1$  is conceptually linked to another entity, whose role it shares. The difference between the 'and' and the 'too' uses is that in the use glossed 'too,' the conceptually linked entity is not represented by a conjoined participant in the same clause, but rather is understood from the preceding context.

The various translations of  $7o^1$  in English are thus seen to correlate with different formal contexts in which the morpheme appears. When it appears between two nominals, conjoining them, it is translated as 'and,' when it introduces a peripheral participant at the end of the clause it is translated 'with,' and when it introduces a focused element at the beginning of the clause, it is translated 'also' or 'too.'

## 2. Applicative uses of $7o^1$

In this section, the syntax and semantics of incorporated, 'applicative'  $7o^1$  are described. First I briefly mention certain word ordering and grammatical marking patterns in Chatino that are relevant to understanding the applicative  $7o^1$  construction. Then I describe the effects of incorporating  $7o^1$  into stems with intransitive and transitive roots.

*2.1. Relevant word order and grammatical marking facts.* The most frequent word order found in texts in Chatino is VSO, an order illustrated by several of the examples above. Other orders include SVO and OVS—either the subject or the object can be placed in sentence-initial position for rhematic emphasis or contrast. The direct object of a transitive verb, when it is not preposed, occurs following the subject (when *it* is not preposed). A human or human-like direct object is optionally marked by the dative preposition  $7in^1$  'to.' Oblique nouns follow the VS(O) complex. Nouns that name places or times, when used as locatives or temporals with regard to the event, occur unmarked in the usual position occupied by obliques (i.e., following the object if there is one).

When the subject occurs after the verb, there is an especially tight syntactic link between the verb and the subject. The only context in which some other participant has been observed to occur between the verb and the subject is that of a dative-subject construction such as in the following example:

- 7) *cha*<sup>73</sup> *ki-ja*     *7in*<sup>1</sup> *yu*<sup>2</sup>     *tkwin*<sup>21</sup> *y-a*<sup>12</sup> *yu*<sup>2</sup>  
 so.that P-appear to man road C-go man  
 ‘so that he could find the way he had gone (lit.: so that the road that he had gone would appear to him)’

In example 7 (ceniza 015), the syntactic subject of the verb *kija* ‘P.appear,’ *tkwin* ‘road,’ occurs following the dative subject *7in yu* ‘to him.’ In general, however, direct objects and obliques cannot occur between the verb and the subject:

- 8) \* *l7an*<sup>12</sup> *7in*<sup>1</sup> *xwa*<sup>32</sup> *liya*<sup>24</sup>  
 C-see to John Mary  
 ‘Mary saw John’

is not accepted because *xwa*<sup>32</sup>, marked as a direct object, occurs between the verb and the subject, *liya*<sup>24</sup>.

Because of the rigid pattern of VS ordering, when *7o*<sup>1</sup> occurs between a verb stem and its subject, as in the following example, it appears to have been incorporated into the verb stem:

- 10) *n-ty7an*<sup>2-7o</sup><sup>1</sup> *x7na*<sup>21</sup> *wa*<sup>2</sup>     *ka7*<sup>2-tla7</sup><sup>12</sup> *nty-ku*<sup>2</sup> *wa*<sup>2</sup>  
 H-walk- owner 1pl.excl corn.husk H-eat 1pl.excl  
 ‘our owner brings us corn husks that we eat’

In this use, *7o*<sup>1</sup> can be suffixed derivationally to a large number of stems. Syntactically, the contrast between the derived and underived stems may be stated simply: the derived stem is formally transitive, whether the underived stem is transitive or not. In example 10, the verb root is intransitive, but the stem with *7o*<sup>1</sup> is transitive. It takes a direct object, *ka7*<sup>2-tla7</sup><sup>12</sup> ‘corn husk.’ That *ka7*<sup>2-tla7</sup><sup>12</sup> is a direct object is evident in that it occurs immediately following the subject and that it is unmarked although it names neither a place nor a time. When the direct object in such a construction is human, it is usually marked with *7in*<sup>1</sup> ‘to’ (see examples 11, 12, 16a, etc. below).

2.2. *Incorporation of 7o*<sup>1</sup> *with intransitive roots.* The most general semantic result of deriving a transitive stem from an intransitive root is that both the subject and the object of the derived form have semantic roles similar to that of the subject of the underived form. Thus, the meaning of the source of applicative *7o*<sup>1</sup>, ‘and/with/too,’ is apparent in the grammaticalized form. In example 10 above, both the subject and the direct object move along the path of motion. A difference between their roles is that in most cases, the subject is interpreted as being more responsible for the event than the object, while the object may be interpreted as being affected, and certainly as having no volition. In a general sense, however, with *7o*<sup>1</sup>-derived stems based on intransitive roots, the subject and the object are understood as performing the action together, and this reflects the meaning ‘with/and’ of the source of applicative *7o*<sup>1</sup>. For example, one sub-class of

intransitive verb roots, intransitive verbs of motion, derive transitive verbs according to a pattern exemplified by  $-a^{12}$  'go' :  $-a^{12}-7o^1$  'take':

- 11)  $y-a^{12}-7o^1$   $ta^2$   $ma^{32}-xu^7^2$   $kwla^2$   $kwa^{43}$   $7in^1$   $snye^7^2$   $\emptyset$   $s7en^2$   $sten^{24}$   
 C-go- ? old.lady old there to child 3 place P-take.(car)  
 $\emptyset$   $ni^7^2$   $ka^2-mwyun^{24}$   
 3 in car  
 'The old lady took her daughter to where she would take the car'

Here, the verb glossed 'take' means that the subject and the object 'go' together, but that the subject is responsible. Most other kinds of intransitive roots deriving transitive stems with  $7o^1$  follow the same pattern:

- 12)  $nkw-jin^2-7o^1$   $ka^2-mwyun^{24}$   $7in^1$   $ne^7^2$   $kwla^2$   $t7wa^2$   $kichen^2$   
 C-pass- car to person old mouth town  
 'the car left the old lady off far from the edge of town'
- 13)  $nkw-xen^2-7o^1$   $kwyu^{24}$   $nu^2$   $lyu^7^2-ti^1$   $n-tkwa^{14}$   $chu7n^{12}$   
 C-roll(intr)- horse NOM small N-sit back  
 'the horse rolled with the child that was riding it'
- 14)  $nkw-7wa^1-7o^1$   $Xwa^{32}$   $7in^1$   $Liya^{24}$   
 C-be.washed.away- John to Mary  
 'John and Mary were washed away (it was probably John's fault; perhaps he grabbed Mary as he was being washed away)'
- 15)  $jykw_i^2-7o^1$   $ka^2-lu^{24}$   $ntyga^2$   $na^{32}$   $x7wi^2$   $lo^2$   $o^4$   
 P.boil(intr)- soup all thing P.be in it  
 'the soup will boil with all of its ingredients'

The transitivity resulting from incorporation of  $7o^1$  with an intransitive root contrasts with that resulting from the derivational causative-transitive prefixes  $s-/x-/xi-$ , as illustrated in the following examples:

- 16a)  $n-sna^{32}-7o^1$   $Liya^{24}$   $7in^1$   $Xwa^{32}$   
 N-run- Mary to John  
 'Mary kidnapped John (and is fleeing with him)'
- b)  $n-xi^1-sna^{32}$   $Liya^{24}$   $7in^1$   $Xwa^{32}$   
 N-make-run Mary to John  
 'Mary is making John run, chasing him off'

- 17a) *nkwa-7wa<sup>1</sup>-7o<sup>1</sup>*      *Xwa<sup>32</sup> 7in<sup>1</sup> Tyu<sup>24</sup>*  
 C-be.washed.away- John to Peter  
 ‘John and Peter were washed away (John’s fault, if anyone’s)’
- b) *nw-x-7wa<sup>1</sup>*      *Xwa<sup>32</sup> 7in<sup>1</sup> Tyu<sup>24</sup>*  
 C-make-be.washed.away John to Peter  
 ‘(i.e., John threw Peter in the water and the current carried him away)’

In the a) examples, the subject carries out the activity or undergoes the experience as well as the direct object, and it is also implied that the subject is somehow responsible for the event’s occurrence (probably, the more volitional the activity denoted by the root, the greater the responsibility assumed by the subject of the derived stem—‘to kidnap’ being somewhat stronger in volitionality and responsibility than ‘to be at fault in being washed away with someone’). The main semantic similarity between the applicative *7o<sup>1</sup>* constructions and the causative-transitive constructions is that for both the participant coded as the direct object experiences or carries out an event without volition and without initiating the event.

In the case of the causative-transitive construction, the subject and the object are both present at the inception of the event, the subject causing the object to manifest the event denoted by the verb root. The schema is quite clear in example 16b, as depicted by the following diagram:

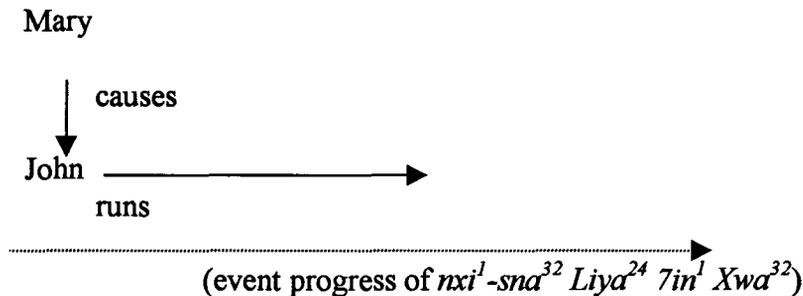


Figure 1: The derived transitive-causative construction

In the applicative *7o<sup>1</sup>* construction, the direct object is not necessarily present at the inception of the event, but is somehow drawn into the event (example 16a):

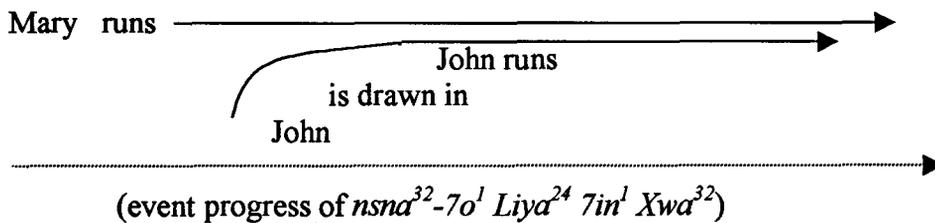


Figure 2: The applicative *7o<sup>1</sup>* construction

When native speakers are asked to imagine contexts that would lead to the use of the applicative  $7o^1$  construction, they generally suggest situations that evoke precisely the schema illustrated in *Figure 2*. Example 17a is typical: native speakers explain that a likely scenario for this utterance is that John is in the process of being washed away in a river and grabs onto Peter, causing him also to get washed away.

Intransitive verbs of vocal expression behave somewhat differently from verbs that follow the most productive pattern—in the following examples, it is not clear that the subject and the object both talk or both laugh:

- 18) *nty-kwi7<sup>2</sup>-7o<sup>1</sup> Liya<sup>24</sup> nu<sup>2</sup> ki7yu<sup>1</sup> snye7<sup>2</sup> cha7<sup>2</sup> nw-kwa<sup>23</sup>-k7wi<sup>32</sup> Ø*  
 N-talk- Mary REL male child because C-get-drunk 3  
 ‘Mary is verbally abusing her son because he got drunk’
- 19) *nw-styi<sup>1</sup>-7o<sup>1</sup> Xna<sup>24</sup> 7in<sup>1</sup> Tyu<sup>24</sup> cha7<sup>2</sup> nw-lyu<sup>1</sup> lo<sup>2</sup> nwtzu7<sup>24</sup>*  
 C-laugh- Joana to Peter because C-fall on mud  
 ‘Joana laughed at Peter because he fell in the mud’

Similarly, when  $7o^1$  introduces an oblique participant to a clause centered around the event *kwi7* ‘talk,’ that participant is not necessarily interpreted as performing the event ‘with’ the subject; just as easily, it can be interpreted as the recipient of a spoken message:

- 20) *ka7n<sup>21</sup> nty-kwi7<sup>1</sup> Ø 7o<sup>1</sup> Ø ra<sup>4</sup>-ka7n<sup>43</sup> nw-sla<sup>1</sup> wan<sup>2</sup> l7an<sup>2</sup> kwa<sup>43</sup>*  
 then N-talk 3 with 3 then C-open 2pl house there  
*jwin<sup>2</sup> an<sup>4</sup>*  
 said 1pl.incl  
 ‘then he said to them, ‘open that door, I (lit. ‘we’) order you’

In the example, the underlined 3<sup>rd</sup> person Ø, marked by  $7o^1$ , does not join the subject of the verb *kwi7<sup>2</sup>* ‘talk’ in performing the action, but is merely the recipient of the message. This partially explains the difference between *kwi7<sup>2</sup>* ‘talk’ and verbs like *sna<sup>32</sup>* ‘run’ when they occur with applicative  $7o^1$ .

Examples like *styi<sup>1</sup>-7o<sup>1</sup>* ‘laugh at’ and *kwi7<sup>2</sup>-7o<sup>1</sup>* ‘verbally abuse’ are unpredictable but not overly surprising results given the schema for applicative  $7o^1$  constructions illustrated in *Figure 2*. It is hardly imaginable that a participant could be involuntarily caused to speak or laugh along with another person, but, given that an accompanier in an event of speaking can be the recipient of the spoken message, a participant that is involuntarily drawn into such an event could easily be someone who is being scolded or ridiculed.

It is not always clear, in the case of a transitive stem derived from an intransitive root by means of  $7o^1$ , that the subject is more responsible for the event—sometimes the contribution of  $7o^1$  is merely to mean that the participants are involved in the event at the same time and place. In the following example, it is not necessary that the Virgin be

holding the bouquet of roses or be responsible for their appearance, only that the Virgin and the roses appear together:

- 21) *nkwlα<sup>1</sup>-7o<sup>1</sup> jy7an<sup>1</sup> an<sup>2</sup> ska<sup>2</sup> ykα<sup>2</sup>-kye<sup>23</sup> xlyα<sup>34</sup>*  
 C-appear- mother 1pl.incl one flower.stem Spanish  
 'the Virgin appeared with a rose/the Virgin and a rose appeared together'

When an inanimate participant is the subject of a verb stem with applicative *7o<sup>1</sup>*, the subject is not seen as fully responsible for the event, but such a construction is still judged acceptable:

- 22) *nkwlα<sup>1</sup>-7o<sup>1</sup> ska<sup>2</sup> ykα<sup>2</sup>-kye<sup>23</sup> xlyα<sup>34</sup> 7in<sup>1</sup> jy7an<sup>1</sup> an<sup>2</sup>*  
 C-appear- one flower.stem Spanish to mother 1pl.incl  
 'the bouquet of roses appeared with the Virgin'

An inanimate subject can be seen as responsible in a limited way for an event if it is involved at an early stage and its involvement brings about the involvement of the other participant:

- 23) *nk-7wα<sup>1</sup>-7o<sup>1</sup> kα<sup>2</sup>-nwyun<sup>24</sup> 7in<sup>1</sup> Xwα<sup>32</sup>*  
 C-be.washed.away- car to John  
 'the car carried John away in the water (John was standing there; the car was being washed down the stream and it took John with it)'

while the attempted

- 24) *nk-7wα<sup>1</sup>-7o<sup>1</sup> Xwα<sup>32</sup> kα<sup>2</sup>-nwyun<sup>24</sup> 7in<sup>1</sup> Ø*  
 C-be.washed.away- John car of 3  
 'John and his car were carried away in the water'

was judged hard to imagine, as John could hardly drag his car into the stream while being washed away.

2.3. *Incorporation of 7o<sup>1</sup> with transitive roots.* *7o<sup>1</sup>*-derived stems based on transitive roots are in one respect quite different from those based on intransitive roots. With such verbs, the direct object is not interpreted as participating in the event in the same role as the subject, but rather in the same role as would an *object* of the verb without *7o<sup>1</sup>*. It is further implied that some other participant exists, with the same semantic role as the object, but this participant is often not mentioned in the sentence:

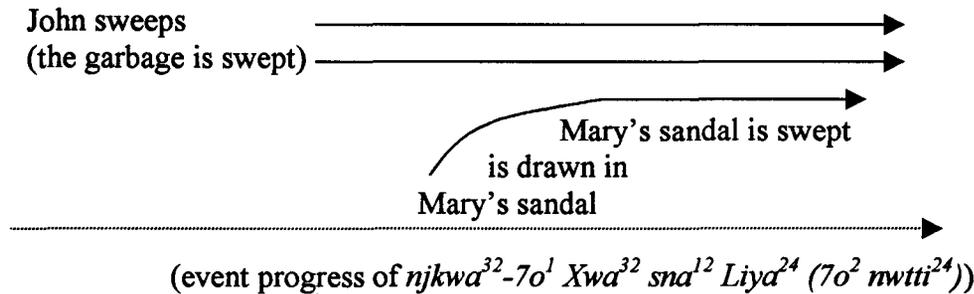
- 25) *nw-jkwα<sup>32</sup>-7o<sup>1</sup> Xwα<sup>32</sup> snα<sup>12</sup> Liyα<sup>24</sup>*  
 C-sweep- John sandal Mary  
 'John swept Mary's sandal (along with something else, e.g., the dirt)'

- 26) *nw-ta<sup>21</sup>-7o<sup>1</sup> tza:<sup>2</sup> ne<sup>7</sup> nta<sup>3</sup> 7yan<sup>32</sup> s7en<sup>2</sup> nw-s7i n<sup>32</sup>*  
 C-give- accidentally person bean to.1sg place C-buy 1sg  
*ska<sup>34</sup>*  
 sugar  
 'they accidentally gave me beans (also) where I bought sugar'
- 27) *nw-kkin<sup>2</sup>-7o<sup>1</sup> Xwa<sup>32</sup> kwtā<sup>24</sup> 7in<sup>1</sup> Ø s7en<sup>2</sup> nw-kkin<sup>2</sup> jyan<sup>21</sup>*  
 C-burn- John cattle of 3 place C-burn field  
 'John burned his cow where he was burning his field'

The other participant with a semantic role similar to that of the direct object can be mentioned, and if it is, then it is expressed as an oblique participant marked by *7o<sup>1</sup>*:

- 28) *nw-jkwa<sup>32</sup>-7o<sup>1</sup> Xwa<sup>32</sup> sna<sup>12</sup> Liya<sup>24</sup> 7o<sup>1</sup> nwtti<sup>24</sup>*  
 C-sweep- John sandal Mary with garbage  
 'John swept Mary's sandal with the garbage'

Examples 25-28 illustrate the most productive pattern resulting from the incorporation of *7o<sup>1</sup>* into a verb stem with a transitive root. Applicative *7o<sup>1</sup>* can occur with essentially any transitive verb root to mean that the patient expressed as direct object shares its involvement with some other, often unmentioned, entity. An additional implication typically present in such examples is that the executor does not intend the involvement of the patient that occurs as a core argument in the clause. The schema illustrating the applicative *7o<sup>1</sup>* construction in *Figure 2* can be extended to include transitive roots as in *Figure 3*:



*Figure 3: the applicative 7o<sup>1</sup> construction with transitive events*

### 3. The incorporation of *7o<sup>1</sup>* as a voice phenomenon

A consistent feature of the applicative *7o<sup>1</sup>* construction is that the direct object in such a construction never experiences involvement in an event that is similar to that of the agent of a transitive or intransitive event. Although non-applicative *7o<sup>1</sup>* can link an oblique participant conceptually to a transitive agent, a transitive patient, or an intransitive subject (either agent or patient), applicative *7o<sup>1</sup>* links direct objects only to patient semantic roles. The patientive category demonstrated by this pattern appears in a language whose grammatical relations are otherwise nominative-accusative.

Specifically with regard to the applicative  $7o^1$  construction, it is not clear why there should not exist the possibility of constructing sentences on the model of (the non-occurring)

- 29) \* *nw-ny $\alpha^{24}$ -7o $^1$  xwa $^{32}$  7in $^1$  tyu $^{24}$  l7an $^2$*   
 C-build- John to Peter house

meaning that John and Peter build the house together. The non-occurrence of such examples might be related to another semantic dimension that cuts across the various uses of applicative  $7o^1$ , the dimension of voice.

Davis and Saunders (1989) explain the apparently paradoxical behavior of the Bella Coola suffixes *-m-* and *-amk-*, which appear to increase the transitivity of the event in some clauses while decreasing it in others, by demonstrating that these suffixes mark the event-peripherality of a participant that is nuclear to the proposition. For an event that is syntactically intransitive without *-m-* or *-amk-*, the occurrence of one of these morphemes on the verb corresponds to the presence of a core argument in the clause. The verb stem becomes formally transitive, while the presence of *-m-* or *-amk-* indicates that the non-executor participant is not central to the event itself. For an event that is inherently transitive, the affixation of *-m-* or *-amk-* similarly indicates that the participant should be understood to be less central to the event than would be the case in the absence of *-m-* or *-amk-*.

The dimension of centrality-to-event is part of the semantics of applicative  $7o^1$  in Chatino as well. In example 13, the child is not central to the event of rolling undergone by the horse, but is caught up in it as a result of having been riding the horse. Taking another example, the reduced centrality of the direct object of the verb  $-a^{12}$ - $7o^1$  'take' in the event  $-a^{12}$  'go' is apparent when that stem is compared with the monomorphemic stem  $-7ya^{32}$  'take':

- 30) *y-a $^{12}$ -7o $^{32}$  ska $^{712}$  re $^{34}$*   
 C-go-2sg gourd this  
 'take this gourd (to some place and leave it there)'

- 31) *nk $w$ -7ya $^{-1}$  ska $^{712}$  re $^{34}$*   
 C-take-2sg gourd this  
 'take this gourd (for your use)'

The direct object *ska $^{712}$*  is involved in only part of the event  $-a^{12}$  'go' in example 30. The participant denoted by the subject of the verb returns without the gourd. In example 31, by contrast, the direct object is centrally involved in the event  $-7ya^{32}$  'take' in that the action of 'taking' cannot be performed without the taken object. The affixation of  $7o^1$  indicates that the direct object is involved in the event denoted by the root, but only peripherally. The direct object does not initiate or control the event, but becomes caught up in it. The verb becomes syntactically transitive, but the object is less central to the event than is the object of a verb that is inherently transitive.

When it occurs with transitive roots, applicative  $7o^1$  has the same effect: it indicates that the involvement of the participant coded by the direct object should be understood as somewhat peripherally involved in the event. Two semantic consequences of affixation of  $7o^1$  to transitive roots illustrate this effect. First, the use of  $7o^1$  with most transitive roots entails that an additional participant exists (although it may be unmentioned) with the same semantic role as that of the direct object. That the direct object always shares its involvement in the event with some other entity reduces its centrality to the event. Second, it is often implied that the agent does not intend the involvement of the participant that is coded as direct object—the agent may be performing an action on some other entity and the participant denoted by the direct object is accidentally included. The involvement of the direct object in the event is thus less central than it would have been if the agent had intended its involvement. If the agent does intend the inclusion of the direct object in the event, an alternative construction may be used, as in the following example:

- 32)  $7o^1$   $chi7n^{32}$   $ti7a^2$   $nwjkwán^{32}$   $kw-7ya^{-32}$   
 also little water holy P-bring-2sg  
 ‘and take a little holy water too’

The suffixation of  $7o^1$  to the root  $lo^{24}$  ‘take out’ results in an idiomatic change of meaning in the stem, as illustrated in the following examples:

- 33a)  $nkw-lo^{24}$   $xwa^{32}$   $ntten^{24}$   
 C-take.out John person  
 ‘John took the person out’
- 33b)  $nkw-lo^{24}-7o^1$   $xwa^{32}$   $ntten^{24}$   
 C-take.out- John person  
 ‘John took the person out (intending to do harm to the person)’
- 34a)  $nkw-lo^{24}$   $xwa^{32}$   $sna^{12}$   $\emptyset$   
 C-take.out John sandal 3  
 ‘John took out his/her sandal’
- 34b)  $nkw-lo^{24}-7o^1$   $xwa^{32}$   $sna^{12}$   $\emptyset$   
 C-take.out- John sandal 3  
 ‘John took out his/her sandal (e.g., to hide it)’

The implication that the subject has nefarious intentions in taking the object out is not predicted by the general schema described above for applicative  $7o^1$ , and there is also no implication in 33b and 34b that another unmentioned participant is involved. However, the notion of peripherality-to-event is completely compatible with the meaning of the stem  $lo^{24}-7o^1$ —the agent has some ultimate purpose in mind for the patient other than that

expressed by the root, in light of which the patient's involvement in the event  $lo^{24}$  'take out' is only incidental.

While the direct object of a stem with applicative  $7o^1$  is only peripherally involved in the event denoted by the root, its coding as a core argument of the clause indicates that it is intended to centrally occupy the hearer's intention. In the following example, taken from a traditional narrative, it has been established earlier in the discourse that the addressee will be travelling with her husband. The speaker's focus is clearly on the upcoming activity of the addressee, while the additional information that the travel will be with the addressee's spouse is contextual:

- 35)  $tza^{24}-t7en^{-32}$   $bu^{32}-rru^2$   $kwa^{43}$   $7in^{-32}$   $cha7^2-nu^2$   $tykwa^{-32}$   $tza^{-32}$   
 P.go-take-2sg burro there of-2sg so.that P.sit-2sg P.go-2sg  
 $7o^1$   $t7a^{12}-nt7in^{-32}$   $jwin^2$   
 with spouse-2sg said  
 'you will take your burro so that you can ride it when you go with your husband, he said'

By contrast, the following example occurs in a narrative in which  $xwa$  'John' is the central character, but in a local context in which his wife has been performing a series of actions. Both of these participants occur as core arguments:

- 36)  $ka7n^{32}$   $mu^2-ka^3-ti^2$   $n-kya^{12}-7o^1$   $ne7^2$   $7in^1$   $xwa^{32}$   $ra^3-ka7n^{32}$   
 then DSC C-go- person to John then  
 'then she took him (to her house)'

( $nu-ka-ti$  in example 36 is a hesitation device.) Note that in the Chatino sentences 35 and 36, as in their English translations, the narrated events are probably not very different—in fact they might easily be indistinguishable from the perspective of an objective observer. Most likely, in both events the two people walk or ride together. The contrast between the two constructions is a result of the speaker's different construals of two similar events. Part of the difference between these construals is that in the second sentence both participants receive some focus.

We now return to the question of why the use of applicative  $7o^1$  corresponds only to the presence of an argument that has a patientive role. The answer is that the degree of peripherality-to-event signalled by  $7o^1$  is not observed by speakers of the language to occur with agents. Agents are more in control, and their involvement is more intended than is that of the participant whose presence as a core argument of the clause becomes the occasion for the use of applicative  $7o^1$  to signal their event peripherality.

This result is not predicted by the meaning of the source morpheme of applicative  $7o^1$ , since agent-like participants can be companions marked by  $7o^1$  (example 4a) and agents can be conjoined by  $7o^1$  (example 4b). Rather, the limitations on the semantic roles of direct objects in applicative  $7o^1$  constructions appear to be a consequence of the peripheral-to-event semantics that are specifically associated with applicative  $7o^1$ .

#### 4. Conclusion

In this paper I have described the syntactic and semantic characteristics of applicative  $7o^1$ , focusing on its semantics. Part of its meaning derives from its source, a word  $7o^1$  meaning 'with' or 'and.' Part of the meaning of applicative  $7o^1$  seems to be independent from that of its source. When incorporated into the verb stem,  $7o^1$  indicates that the direct object should be understood as peripherally involved in the event. That aspect of the meaning of the applicative morpheme can be seen as closely related to the fact that the direct object of a stem with applicative  $7o^1$  always has a patientive semantic role.

#### Notes

1. I wish to thank Martín Suárez and José Suárez, native speakers of Yaitepec Chatino, for brainstorming a list of verbs with incorporated  $-7o^1$  and for providing many of the examples used in this paper. Much of the data used for this paper was gathered while I worked as a member of the Project for the Documentation of Meso-American Languages, headed by Terrence Kaufman. I also wish to thank Philip Davis, without implying that he would agree with the claims made in this paper, for many helpful suggestions.
2. The main departures from the IPA used in transcribing examples in this paper are: /ʔ/ => ʔ, /tʃ/ => ch, /ts/ => tz, /c/ => ty, /ʃ/ => x, /h/ => j. Nasalization of a vowel is transcribed as an *n* following the vowel: /ã/ => an, etc. Tones, which are contrastive in lexical items and which also occur as grammatical morphemes, are transcribed with superscript numbers: 1 = high, 2 = mid, 3 = mid-low, and 4 = low. Contour tones are transcribed with sequences of superscript numbers. The following abbreviations are used: P 'Potential Aspect,' N 'Continuous Aspect,' H 'Habitual Aspect,' C 'Completive Aspect,' NOM 'Nominalizer,' DSC 'Discourse Marker.'

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## **Language Replacement in a Náhuatl Speaking Community: Testimonies of the Speakers and Their Children**

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### **Preliminary Information.**

Tuxpan is a prehispanic community located about 130 kilometers South from Guadalajara, the capital of the state of Jalisco. In 1990, it almost reached 35000 inhabitants.<sup>1</sup> Although colonization for Tuxpan was not very different from what happened to other indigenous communities, recent history has been perhaps more distinctive, more severe, in terms of more contact with mestizo Mexican society.

At the beginning of this century, Náhuatl was spoken as a first language by the majority of the indigenous population. However, during the first two decades of the century, there were various, profound changes which took place in Tuxpan. From the numerous interviews conducted with speakers of the language who were born before 1920, it is clear that it was during these years when Náhuatl was no longer transmitted to Tuxpanec children as a first language. The situation at this moment (end of the century) is that there are less than ten speakers of the language, although a revitalization project started in 1988, fostered by the city authorities.

In this paper I will talk about how the replacement process took place, according to the testimonies of those women and men, native speakers of Náhuatl, and their children, which were obtained during six years of field work. The interviews were carried out with all those women and men who accepted to talk to me, under the criteria that they were either Náhuatl speakers or at least had grown up listening to Náhuatl within a family environment. Shortly after, I realized it would not be enough to know the point of view of these elders, since the process involved younger generations and a group I had not originally considered, those who were identified as “outsiders”, but made Tuxpan their place of living more than 50 years ago. I decided then to broaden the number of interviewees, to include the elders’ children and a number of those people who came to live to Tuxpan and stayed.

The information I present has to do with the testimonies uttered by those who once were native Mexicano speakers, and their children, or those who admitted were born within a Mexicano speaking family. They were divided into two groups, those who were born before 1920, are called generation #1, and those who were born between 1921 and 1940, generation #2. The paper approaches the way people from Tuxpan believe the replacement of Mexicano took place. Their perspective upon such facts is strongly considered, and as I expect to show, there are significant changes from what is seen as a leading factor which influenced the replacement of Mexicano for generation #1 and that which influenced such a process, for generation #2. The testimonies I was able to collect, mainly during the celebration of catholic festivities in Tuxpan have been segmented into “statements”, considering the ideas that were expressed.

The paper is divided into three parts. First I make some general notations of the present situation of Tuxpan; in the second part I comment upon the testimonies uttered by the Tuxpanec interviewees who belong to generation #1. In the third I take the testimonies

of those who belong to generation #2. Finally, I comment upon language contact, bilingualism, diglosia, and other sociolinguistic matters.

### **Tuxpan in the twentieth century.**

At the beginning of the twentieth century, Mexicano was spoken as the mother tongue by the majority of the people in Tuxpan, although there were already some who were bilingual in Mexicano and Spanish. However, during the first twenty years of the century there were profound changes which took place. Tuxpan was severely affected by national and regional historical events. The Mexican Revolution took place and the area surrounding Tuxpan witnessed several battles between two of the factions. The agrarian reform that began as a result of the 1910 revolution also affected Tuxpan, since the community was divided: many peasants demanded land, but the Church strongly opposed the initiative. That chapter in the history of Tuxpan ended with some of the Tuxpanecs applying for land, while others followed the Church's directives.<sup>2</sup>

From what I have learned through the numerous interviews I have conducted with people who were born before 1920, it was during these years that Mexicano was no longer transmitted to Tuxpanec children. Some interviewees have told me that whereas the older children of the family grew up speaking Náhuatl as their first language, the younger brothers and sisters of the same family spoke Spanish instead. A very rapid switch took place during those years.

Then, during the following decades, the surrounding region hosted several important industries, which attracted people from other states and cities to establish themselves in Tuxpan, as well as Zapotlán, Zapotiltic and others. The largest number of new workers seems to have arrived during the 1940's and 1950's when the paper industry of Atenquique (Compañía Industrial de Atenquique), established itself only 6 miles from Tuxpan. This company attracted many people from neighboring towns (Jilotlán, Colima, Tecomán, and others), and states (Michoacán, Colima, and Guanajuato) to work there; many of them chose Tuxpan as their living place.

As years have gone by, Tuxpan has become more and more "modern". A large part of the town has paved streets, stores which offer updated and expensive fashion items, there are discotheques and other type of events such as beauty queen contests that make Tuxpan seem like any other middle size Mexican city. Perhaps, the only thing that makes it seem different to somebody who is not familiar with its history, is the fact that there are more than 50 Catholic celebrations during the year, an activity which makes Tuxpan a merry, lively town.

However, there have been serious conflicts between two sectors of the population: the Tuxpanec group and the "outsider" group.

The presence of outsiders ("fueranos", "kixtianos"), has represented racist and derogatory attitudes against Tuxpanecs in their own land. They strongly stigmatized the Tuxpanec population when they ever heard them speaking Mexicano, saying they talked like birds, this is "incomprehensible", "illegible". The list of harassment could go on. Also, although outsiders frequently participate in the Catholic celebrations, they strongly criticize Tuxpanecs' large banquets and the extensive fireworks celebration, and call them "scandalous", "noisy". They say that Tuxpanecs may have nothing to eat, but are eager to spend too much money and even get indebted in order to have such fiests.

When we look at the number of speakers of Náhuatl from the census of the same decades, although taken with “a grain of salt”, we can see that there was rapid decline in the first half of this century:

|             |                                |
|-------------|--------------------------------|
| <b>1930</b> | <b>754 speakers</b>            |
| <b>1940</b> | <b>244 speakers</b>            |
| <b>1950</b> | <b>48 speakers<sup>3</sup></b> |

Let us now take a look at the responses given by those who were interviewed.

### **Generation # 1: Memory of Mexicano.**

I interviewed about forty persons, mostly women, who were born before 1920. Many of them remembered some speech acts, two of them even a couple of songs; there were four women who could sustain a conversation in Mexicano, with some difficulties. However, they spoke Mexicano upon my request, since they did not speak the language in any context. Apparently, they used to talk in Mexicano until a few years ago when they visited each other, but this does not happen any more. The only speech act that remains is that of greeting some politician who goes there seeking votes. “Ke miztlamate huey elákat!” (Good afternoon, distinguished man).

When I have asked people during field work, to describe where Mexicano was spoken, what, in their opinion, were the causes that lead Mexicano to be replaced as the first language of Tuxpanecs amongst other things, I have obtained different answers that indicate factors which could be summarized as follows:

- Dying out causes**
- Indian identity was oppressed**
- Fracture in the cohesion of the Tuxpanec group**
- Spread of the “mestizo” society**

By “dying out” I mean that Tuxpanec people when asked why Náhuatl was substituted by Spanish, the most frequent answer, was that “those people”, -the Náhuatl speakers-, died, that many of them went to live to another city. This, is an equivalent of dying since those who left did not return to Tuxpan. The interviewees also establish a relationship with the wearing of the black “sabanilla”. This garment has disappeared and is no longer used because the person who used to make them and sell them in Tuxpan also died. Such statements reveal that the forces which could continue the transmission of the language, died, reached an ending point in the cycle.

In the second heading, I have grouped those answers that reveal the feeling that Mexicano speakers were severely stigmatized in their own land by outsiders. It is said that little by little, Tuxpanecs were “thrown” to the outskirts of the town. This happened because outsiders arrived and had enough money to buy properties in the downtown area, or some Tuxpanecs got indebted with these people and were not able to pay the loan. They ended up leaving their homes. It was popular to say that the “the Indians live at the other side of the rail road tracks, that is where they are”. People from Tuxpan were very sensitive to discrimination, understood as the denial of the right to being different. Such

discrimination came from the not-indigenous group, and Tuxpanecs no longer held the necessary physical and symbolic space they needed in order to continue their development as a group. According to the interviewees, outsiders made them feel ashamed of being Indians, of speaking Mexicano: "They did not understand us. What if they thought we were rude to them? I must say that the presence of "kixtianos" and their increasing number, according to Tuxpanecs, played a significant role in their daily living. They frequently say, "Now it is really different. Tuxpan is a large town, so many people from other places, so many new streets and nice houses..." I shall come back to this matter later. Such an overwhelming presence, along with a "Spanish only" schooling national project denied the existence of a symbolic system developed and maintained by a group in its daily living.

In the third heading, I have grouped the answers that indicate there were "fractures" within the group. People say that their following generation "did not want" to learn/speak/continue the usage of Náhuatl, that "they did not want", "did not like" Mexicano, and that they were even ashamed of speaking it ("les dio vergüenza"). That whenever one of them spoke Mexicano to one of his/her children, s/he would respond "I do not understand", "Do not talk to me in that *ball* language", "What if you are calling me an ox or pig?". Such statements indicate that the usage of Spanish had gained prestige whereas Mexicano had become an indicator of an obscure identity, an undesirable way of being ("ball language", "nobody understands you"). In the research carried out by Jane and Kenneth Hill in the Náhuatl pueblos of Volcano La Malinche, in Puebla,<sup>4</sup> they report that the Indian language was redefined as a marker of an oppressed and worthless identity. A very similar conclusion was reached by the Tuxpanec people.

Finally, Mestizo society spread. Some people say that Mexicano is a "difficult" language, that they required a "good memory", needed to "pay attention" in order to learn it, needed to study it. Since there is no language which is more "difficult" to learn than other as a mother language, when people make such statements, they are indicating that Mexicano was not spoken as much as Spanish, that they did not hear Mexicano as much as they probably heard Spanish. That is why it seemed more difficult to learn. Mexicano did no longer occupy a place as a linguistic vehicle within the community, and it was easier to develop a linguistic, communicative and pragmatic competence in Spanish than in Mexicano. If we add to this the fact that some interviewees say that they required a "good memory", that they did not study the language, we are before a conception of Mexicano as a second language, as strange and difficult as any other second language. Spanish had become the mother tongue of many Tuxpanecs.

### **Generation #2: Children who hardly ever heard Mexicano.**

For this group I interviewed more or less the same number of persons, about 40, who were born between 1921 and 1940. Although there is some agreement between the two generations, there are also some differences on how they explain replacement of Mexicano took place.

Most of the informants heard either their parents or grandparents speaking Mexicano. Although they say it would have been "nice", "a beautiful thing" to maintain Mexicano, they find no practical usage in speaking it in present times. Some of them say that it is not spoken any more because "now, one dedicates herself to work"; "whenever I was told something in Mexicano, I would reply, "do not talk to me like that", "do not insult me; maybe you are saying swear words to me and I do not even realize it." The statements

uttered by these women and men who responded to my questions about the replacement of Mexicano, are summarized as follows:

**-Dying out causes.**

**-Elders did not teach Mexicano to their children**

**-Government policies/schooling policies were not directed towards the maintenance of Mexicano.**

**-Lack of meaningfulness/lack of usefulness of Mexicano.**

In the first heading, I have grouped statements which are very similar in content to those expressed by generation #1. The interviewees say that “those people”, Mexicano speakers, have already died, it is no longer possible to know anything about the language because they are all gone. It would even be out of fashion, outdated, frankly irrational: “If anybody heard me saying right now *Ke miztlamate comadre, kampa tió comadre*, they would think I am crazy”.

Related to this group of answers is the second. They say that elders should have taught their children to speak the language, that they were not interested in transmitting the language so that is why it is no longer spoken.

What constitutes a significant series of statements in terms of content are all those that directly point to “the government” as responsible for not promoting the maintenance of Mexicano through the educational system. They say that there should have been classes (subjects) whose content was Mexicano, in the same way now junior high school students take English; that the government should have been concerned with the maintenance of Mexicano. “School would have been a choice because sometimes teachers succeed in matters where parents do not”, a woman told me.

Directly related to this group is the last one. Various of the interviewees who belong to generation #2 consider there is a strong tie between the language of the government and civilization. A man told me that there are no more Mexicano speakers because Spanish is the language used by the government, therefore, it is the language of civilization. “How then could it have continued being spoken?” “Schooling is very civilized; they would not speak that language at school.” “Those who spoke Mexicano did not go to school, that is why they talked *that*.” Another informant said to me “There are superior words in Spanish. I have already learned Spanish and I can see I speak better now.” “Modern studies are in Spanish. If I had a son I would not speak Mexicano to him.”

As a final comment to the statements uttered by generation #2, I must say that almost none of the informants considers the presence of outsiders as an influencing force in the replacement of Mexicano. They assert that Mexicano had already been replaced by the time the number of outsiders in Tuxpan notably increased. On the other hand, there are comments which reflect ambiguous feelings about Mexicano. Whereas many say it was a “beautiful thing”, that they are sorry they do not have it, sometimes the very same person makes a comment that indicates an opened rejection. Referring to one of the elder women who used to greet a distinguished visitor in Mexicano, a female interviewee asserted: “The day the State governor came, they [the organizers of his staying in Tuxpan] looked for an *Indita* [“little” Indian] so that she would speak to him. The governor likes that, he is

amused with that (gets cheated with that). That is why it would have been nice [to continue speaking Mexicano]. Because women like doña Balbina start speaking like chicken, but I do not understand her.”

**Some thoughts on language contact, diglosia, language conflict.**

There is a large bibliography on language maintenance and language replacement, which can be cited. In the research I have taken what is applicable to this particular case, studies done in the United States as well as in Mexico, partly due to the fact that many of those studies have been carried out in various communities (like the Malinche pueblos in Puebla in the case of Hill & Hill's study, or that by Coronado Suzán in Oaxaca),<sup>5</sup> and partly because I do not have a “complete picture” of how the process of replacing Mexicano took place. By the time I started field work, as interviewees stated, most of Mexicano speakers were no longer alive.

Tuxpan is an isolated Indigenous enclave in the south of Jalisco. I visited various of the surrounding towns and there are no other Náhuatl speaking communities. In this way, I can not generalize my findings and I can not apply so easily what other linguists have found and elaborated. In order to talk about language conflict it is necessary to consider how other linguistic communities have dealt with it and have resolved it, considering the colonial situation in which the language contact phenomena has occurred. There are cases which report resistance and an active revitalization process where the community has become profoundly involved; there are others where we observe a “passive” resistance where it seems that the Indigenous language is no longer used but, for our surprise, it has been confined to very specific speech events and contexts.

In this case, the solution to the linguistic conflict, one closely related to economic, social, political and ideological aspects, was to neglect the Indian language, in either a conscious or unconscious manner. The conflict was solved in its linguistic part leaving Mexicano behind. But it must also be pointed out that Castillianization did not halt the series of derogatory attitudes that Tuxpanecs are forced to bear in their daily life, in a community where the *kixtianos* have gained social and economic positions which were once held by Tuxpanecs. This includes the cargo system of some of the Catholic celebrations.<sup>6</sup>

**Concluding Remarks.**

The members of generation #1 believe it was their children, sons, daughters and grandchildren who broke up with them and did not continue speaking Mexicano. They also consider that the number of outsiders who have made Tuxpan their place of living was very large, that they were influential in the different changes which have taken place in Tuxpan in recent years.

As it can be seen, the influence that outsiders could have had, tends to diminish considerably amongst the second generation. They believe that outsiders said nothing harmful to Mexicano speakers, that Mexicano had already “died out” by the time the number of “kixtianos” living in Tuxpan was already equivalent to the number of Tuxpanecs. On the other hand, a meaningful role is given to schooling: 29 out of 38 interviewees point out that school as an institution should have had a program, a more decisive role leading towards the maintenance of Mexicano. “Maybe, one could have studied Mexicano in the same way one studies English or French”, a school teacher told me.

Now, let us look at what a consultation done at the civil Registration office of the local government in Tuxpan shows about the presence of outsiders. Due to the huge amount of birth certificates in the books, I decided to take a two-year sample of every decade, starting in 1901 and finishing in 1962.<sup>7</sup> One piece of information included in the registration is the birthplace of the child's parents. This was considered as an important, key data which would help me find out whether outsiders who came to live to Tuxpan and practically invaded the community were as many as interviewees assert. These are the results:

**BIRTHS WHOSE PARENTS WERE EITHER FROM TUXPAN OR FROM A DIFFERENT *MUNICIPIO*.**

| YEAR           | FROM TUXPAN | TOTAL /     | OTHER CITY | TOTAL/                  |
|----------------|-------------|-------------|------------|-------------------------|
| 1901           | 229         |             | 87         |                         |
| 1902           | 167         | <b>396</b>  | 124        | <b>211</b>              |
| 1911           | 278         |             | 14         |                         |
| 1912           | 264         | <b>542</b>  | 22         | <b>36</b>               |
| 1921           | 282         |             | 41         |                         |
| 1922           | 305         | <b>587</b>  | 34         | <b>75</b>               |
| 1931           | 297         |             | 61         |                         |
| 1932           | 271         | <b>568</b>  | 47         | <b>108</b>              |
| 1941           | 368         |             | 15         |                         |
| 1942           | 370         | <b>738</b>  | 19         | <b>34</b>               |
| 1951           | 484         |             | 201        |                         |
| 1952           | 441         | <b>925</b>  | 197        | <b>398</b>              |
| 1961           | 558         |             | 334        |                         |
| 1962           | 555         | <b>1113</b> | 289        | <b>623</b>              |
| <b>TOTALS:</b> |             | <b>4869</b> |            | <b>1485<sup>8</sup></b> |

As we can see, the number of Tuxpanecs kept on increasing at a modest but steady rate. On the other hand, the outsiders group shows a very irregular increase pattern from 1901 to 1942, but in the following two decades, there is an increase that goes beyond a thousand percent (1070% in 51-52 in relation with 41-42). This fact deserves much more attention than what I will be giving to it in this paper. It is obvious that Mestizo society did spread in Tuxpan, in a manner that is difficult to imagine at this moment, at the end of the century. It is also difficult to reconstruct. Whatever forces lead Tuxpanecs to replace Mexicano, it is a loss for the culture of the world, and unfortunately, there is probably no way how we will be able to know how Tuxpanecs led their daily living, constructed their history in Mexicano.

### Notes.

<sup>1</sup> This information is according to INEGI, 1991.

<sup>2</sup> See Lameiras, 1990.

<sup>3</sup> Taken from De la Cerda Silva, 1956.

<sup>4</sup> Hill & Hill, 1986.

<sup>5</sup> Hill & Hill, *op. cit.*; Coronado Suzán, 1986 and 1987; Aubague, 1985.

<sup>6</sup> I have reported on several of the catholic festivities that take place in Tuxpan in some brief articles. See Yáñez, 1990 and 1997.

<sup>7</sup> I have taken this year as an ending period for my research. The outsiders whom I have interviewed are those who went to live in Tuxpan before 1962, and have been there since then.

<sup>8</sup> All these numbers were obtained from the books of registration at the City Hall in Tuxpan.

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