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# Variable Affix Ordering in Kuna<sup>\*</sup>

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## 1 Introduction

The purpose of this study is to describe and account for non-templatic and variable affix order in Kuna, a Chibchan language spoken in Panama. The majority of Kuna verbal affixes can be ordered transitively, meaning that a fixed ordering or template can be constructed such that each affix is positioned at a certain morphological distance from the verb. The affixes fall into two major groupings: inner affixes, which appear nearer the verb root, and outer affixes, which appear farther away. However, some complications are introduced by the future affix *-oe* which straddles the boundary between the two groupings. An exceptional group of affixes (*-oe* ‘FUT’, *-suli* ‘NEG’, *-mala* ‘PL’, *-moga* ‘also’, *-bali* ‘again’) is able to produce adjacency pairs with not only the orders *-a-b* and *-b-c* but also *-c-a*. This property will be referred to as non-transitive ordering; it is what makes a template model untenable. Furthermore, three-affix combinations from the exceptional group exhibit variable affix ordering, such that there are two possible grammatical orderings of a set of three affixes (*-a-b-c* and *-c-a-b*). This is not attributable to dialect differences, since a single speaker has been recorded using both orderings at different points in the same conversation. The question of which two orderings are grammatical is not completely predictable from the data on two-affix combinations. This unpredictability is referred to as non-cumulativity and makes an analysis based purely on adjacency pairs untenable.

In both the unexceptional and the exceptional groups, the ordering of adjacent affixes is very important to determining grammaticality. The proposed analysis incorporates the importance of adjacency by using constraints on ordered pairs of adjacent affixes, or bigrams, following Fabb (1998) and Ryan (2008). A grammatical word must be constructed of a series of grammatical ordered pairs, or bigrams. A set of inviolable constraints against the ungrammatical bigrams accounts for the ordering of all unexceptional affix combinations, as well as all of the two-affix combinations of exceptional affixes (including those exhibiting non-transitive ordering). The remaining data, which consists of three-affix combinations exhibiting non-cumulativity, is only partially explained by the inviolable bigram constraints. In order to explain non-cumulativity, two hypotheses are proposed. The first, based on ideas from Hay and Baayen (2002), is that frequency of bigrams in a text corpus could correlate with grammaticalization of the bigrams into units, such that three-morpheme combinations will preferably contain frequent (or grammaticalized) bigrams. However, a corpus study fails to support this hypothesis. Non-cumulativity is better accounted for using a low-ranked alignment constraint at the boundary between inner and outer affixes.

Finally, the question remains as to how a speaker in a given conversational context chooses between two different orderings of the same string of three affixes. It is proposed that this decision is based on presence or absence of focus on the negative. *Focus* in this sense refers to a contrast between alternatives, as proposed by Krifka (2007). Data from conversations suggests

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that when there is an overt contrast between the negative statement and a positive counterpart, the speaker is more likely to use the NEG-final ordering. This could be because the NEG-final ordering allows the stress to fall on the negative morpheme, because of priming effects from the positive version of the verb form, or because the word-final position makes the negative morpheme more salient.

Section 2 presents data on affix ordering in Kuna, including background information on the inner and outer affix zones and the templatic behavior of the majority of affixes. Section 3 presents data on the exceptional behavior of a certain group of affixes, which would require a template or level-ordering model to allow looping. Section 4 discusses morpheme-specific selectional restrictions and formalizes the selectional restrictions account using OT bigram constraints, showing that most of the data can be accounted for using bigram constraints on ungrammatical bigrams, while the remainder can be accounted for with low-ranked bigram constraints on grammatical bigrams. Section 5 presents data from the corpus study on bigram frequencies, which shows that there is little evidence for the low-ranked bigram constraints. Section 6 revises the OT analysis by replacing the low-ranked bigram constraints with an alignment constraint justified by data from Section 2. Section 7 is the conclusion. The appendix presents conversational data on how affix order is affected by focus on the negative.

## 2 Data on Templatic and Non-templatic Affix Ordering in Kuna

### 2.1 Inner and Outer Affixes in Kuna

Kuna affixes can be divided into two zones or groups; the inner affixes appear closer to the verb root and attach only to a verb stem or other inner affix, while the outer affixes appear farther from the verb root and attach to a wider variety of hosts. In examples (1)-(4), all affixes appearing before the ‘=’ sign are inner affixes, while all affixes appearing after it are outer affixes.<sup>1</sup>

- (1) gun-bi=sur-moga-d<sup>2</sup>  
eat-want=NEG-also-RHET  
‘I don’t want to eat any.’ (June 26, 2008, rec. 11 5:29)
- (2) ebu-sa=mo-ye<sup>3</sup>  
touch-PFV=also-QUOT  
“‘[God] touched [your heart] also’ (I said).’ (June 29, 2008, rec. 1, 2:03)
- (3) immak-nai=mo-soge<sup>4</sup>  
do-PROG=also-say  
“‘[You] are doing [it for free]’ (I said).’ (June 29, 2008, rec. 1, 2:01)

<sup>1</sup> All data are from naturally-occurring conversations recorded on the date given, unless otherwise noted.

<sup>2</sup> The rhetorical suffix *-de*, *-d*, glossed RHET, has very little semantic content; it is used for rhetorical effect.

<sup>3</sup> The Kuna orthography used here is mostly similar to the IPA, but /y/ is pronounced [j] and /ch/ is pronounced [tʃ]. The symbols /b,d,g/ are used for single (voiced/voiceless) stops, while /p,t,k/ are used for double (voiceless) stops.

<sup>4</sup> Kuna /g/ or /k/ before a vowel is pronounced /y/ ([j]). Kuna /ss/ is pronounced /ch/ ([tʃ]).

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- (4) ito-le=sun-do  
hear-PASS=truly-RHET  
'Is it truly heard, then?/You know what I mean?' (June 26, 2008, rec. 11, 5:29)

However, because the exceptional affixes do not always respect the inner/outer boundary, the two groups shall be defined morphologically, as follows:

- a. inner affixes: attach to verb stem or other inner affixes
- b. outer affixes: attach to any lexical root (verb root, verb stem, noun, adjective), inner affixes, or other outer affixes

For most Kuna verbs, the verb stem is identical to the verb root. However, there is a class of verbs in which the verb root needs to be combined with another morpheme to form a verb stem; these are called verbs with defective roots by Erice (1980:125) and are also noted as "regular verbs composed using *gue*" (the copula) by Puig (1946:95). Inner affixes may attach only to a verb stem, while outer affixes can attach directly to the root. In example (5), the outer affix *-moga* attaches directly to a defective root. In example (6a), the inner affix *-sa* cannot attach to a defective root; rather, it must attach to a verb stem, as shown in (6b). The inner/outer boundary is again marked using the symbol '='.

- (5) a. dob=moga<sup>5</sup>  
fear=also  
'is also afraid'

- (6) a. \*dobsa<sup>6</sup>  
b. dob-gu-sa  
fear-COP-PFV  
'got scared'

The defective roots therefore can be used as a test to classify affixes as either inner affixes (such as *-sa*) or outer affixes (such as *-moga*).

Outer affixes may also attach to different categories of words, such as adjectives or nouns. Sherzer (2003:17) notes that *-mala* 'PL' and *-moga* 'also' can attach to both verbs and nouns. In example (7), the outer affix *-mala*, 'PL,' attaches to a noun. In example (8), it attaches to an adjective.

- (7) santos=**mala**<sup>7</sup>  
saints=PL  
'saints' (June 26, 2008, rec. 11, 14:15)

- (8) iglesia ollo=**mala**-d-de  
church empty=PL-RHET-RHET

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<sup>5</sup> Examples (5) and (6) have no recording; they are constructed as representative examples of defective verbs.

<sup>6</sup> Cf. *daksa* (non-defective), morphologically *dake-sa* 'see-PFV'.

<sup>7</sup> This is the standard way of pluralizing borrowed nouns, adding the Kuna plural marker after the Spanish plural marker.

‘The churches [were] empty.’

(June 26, 2008, rec. 11, 15:41)

Likewise, in example (9), the outer affix *-suli* ‘NEG’ attaches to an adjective, and in (10) it attaches to a possessive adjective.<sup>8</sup>

(9) saila war-gwena mullu=**suli**  
hair CL-one short=NEG  
‘One had long hair.’

(June 26, 2008, rec. 11, 17:59)

(10) we bebida ani-ga-d=**suli**-n-dake-n-ye  
that drink 1-DAT-NMLZ=NEG-IMPV-see-IMPV-QUOT<sup>9</sup>  
‘‘That drink wasn’t for me,’’ (she said).’

(June 26, 2008, rec.11, 9:29)

Some outer affixes may also appear as independent words, including *suli* ‘no’, *bali* ‘again, back’, and *sunna* ‘truly, able to,’ but not including *-moga* ‘also’ or *-mala* ‘PL.’

The inner and outer affix groups might be roughly defined as affixes and clitics respectively. The inner affixes generally conform to Zwicky and Pullum’s (1983) definition of affixes, being more selective regarding their bases, only attaching to other affixes, and showing some ‘arbitrary gaps’ in which affixes they can attach to.<sup>10</sup> They also exhibit some semantic idiosyncracies.<sup>11</sup> The outer affixes are less selective about their bases and appear to show no arbitrary gaps or semantic idiosyncracies. To avoid confusion between the cross-linguistic characteristics of affixes and clitics and the language-specific characteristics of the two groups of affixes, they will continue to be called inner and outer affixes.

The existence of the affix *-oe* ‘FUT’, which has some characteristics of both the inner and the outer affixes, suggests the two groups of affixes occupy different areas on a continuous scale from more selective to less selective affixes. There appears to be a cross-linguistic tendency for affixes that appear closer to the verb root to be more selective regarding their hosts, and for affixes appearing further away to be less selective. This tendency in English morphology has been discussed by Hay and Baayen (2002) and Hay and Plag (2004). The distinction between inner and outer affixes in Kuna follows this cross-linguistic tendency of ordering more selective affixes inside less selective affixes.

## 2.2 Templatic Behavior in Kuna Affixes

The distinction between inner and outer affixes gives us some insight into the structure of the Kuna verb. However, it gives no information about ordering within each group. This section

<sup>8</sup> The possessive adjective is formed from the dative and nominalizer, forming the meaning ‘that which is for (me).’

<sup>9</sup> The three-affix sequence *-dakenye* has been grammaticalized as a quotative.

<sup>10</sup> There are some affixes that only appear with certain roots, and some roots that cannot appear with certain affixes. The affix *-dapi* ‘continuing on’ rarely or never appears with any root other than *nae* ‘go,’ although the entire string *-nadapi* may appear after another root *x*, to express the meaning ‘going along *x*-ing.’ The affix *-ali*, ‘PFV, towards the speaker’ obligatorily replaces the perfective *-sa* in the verb *barmie*, ‘send,’ but cannot be used with other verbs. An affix *-ali* on other verbs has the meaning ‘for the first time.’

<sup>11</sup> For example, returning to the affix *-dapi*, although the affix usually means ‘going along,’ when combined with the future affix *-oe*, it gives us the meaning ‘move towards 2nd person;’ the standard way of telling someone that you will visit them in their home is *an bese nadapoe* ‘I will come/go visit you.’ Here, the meaning ‘going along’ is no longer operative.

shows how a fixed partial ordering model such as a template or level-ordering system can explain a large portion of Kuna affix ordering. However, section 3 will show why this type of model is inappropriate for the system as a whole.

Because many Kuna affixes appear in a fixed order, it seems logical to attempt to fit them into a position-class or template model (Kari 1989, Hyman 2003). In a fixed system of affix ordering, each affix is permanently located in a morphological position that remains constant relative to other affixes in the system. Fixed ordering systems are transitive in that if one affix is ordered before another, then it will always come earlier in the word, regardless of any intervening material. Positions are sometimes grouped into zones defined semantically or phonologically (Kari 1989). Words are constructed such that affixes located in earlier positions always come before the affixes in later positions, regardless of any intervening material. In most template models, affixes assigned to the same position class are in complementary distribution; however, there are some models in which affixes in the same position class may appear adjacently with variable ordering.

Kiparsky's (1982) theory of level ordering is in a sense another type of fixed-ordering system. It is similar to template morphology in that it assigns each affix to a level (somewhat similar to a position class). The derivation of the word proceeds linearly through the levels. Even if no affix is attached at a given level, the word continues to proceed to the next level, where another affix may be added. However, a word may not add more than one affix in a given level or proceed backwards through the levels. Because of this, level ordering is transitive in the same way that templates are. However, unlike the position classes in a template, each level is associated with different phonological rules, which apply to the entire word in the same order as the levels. Furthermore, bracket erasure allows more affixes to be added after the category of the word has been changed by a category-changing affix; a phenomenon that occurs in Kuna.

Sherzer (1989, 2003) proposes a seven-position template for Kuna (Sherzer 2003:12). It appears that in Sherzer's model, affixes from a single position class can co-occur. In (11), an abridged version of Sherzer's (1989:266) template is shown, including only affixes that appear in this paper. Each position contains a list of affixes; there is no significance to the vertical location of the affix in the list.<sup>12</sup>

(11)

Position						
1	2	3	4	5	6	7
mai, PROG <sup>13</sup>	sa, PFV	mala, PL	le, COND	diba, COND	sunto, 'truly'	ye, QUOT
gwichi, PROG	oe, FUT	moga, 'also'				
sii, PROG		bali, 'again'				
nai, PROG		suli, NEG				
bukwa, PROG						
dii, PROG						
lege, PASS						

Sherzer's template is designed with an eye to grouping semantically similar affixes, and puts less

<sup>12</sup> The orthography and some of the glosses have been changed to match the conventions of this paper. In the original, *-le* is labeled 'clause connector' and *-diba* 'modality.' In the original chart, Sherzer has *-sunto* instead of *-sunna* for 'truly.' I consider the sequence *-sundo* a combination of *-sunna* 'truly' and *-do* 'then.'

<sup>13</sup> The choice of progressive in position 1 indicates the posture of the subject and other attributes; from the top, the progressives are *lying, standing, sitting, hanging/floating/default, collective, moving/default*.

emphasis on affix order. In order to make progress towards the goal of accurately predicting affix order, this section proposes a fixed ordering system that expands Sherzer's positions 2 and 3 into five distinct positions. The position-1 affixes listed above will be located in two separate positions; if all of Sherzer's position-1 affixes were included, they would generate even more positions.

In (12), a revised ordering of a group of common inner affixes is shown. These inner affixes exhibit fixed ordering, with the passive *-lege* appearing closest to the root, followed by the perfective *-sa*, and then the progressive affixes. The progressive affixes are considered to be at the same position or level in the fixed ordering, and they are in complementary distribution.

(12)	IN <sub>1</sub>	IN <sub>2</sub>	IN <sub>3</sub>
	-lege	-sa	-nai
	PASS	PFV	-gwichi
			-sii
			-mai
			-dii
			-bukwa
			PROG

Example (13) shows the ordering *-lege-sa*, and example (14) shows the ordering *-sa-bukwa*.

- (13) **immak-le-sa**  
make-PASS-PFV  
'[It] was made.'  
(June 26, 2008, rec. 11, 10:33)
- (14) **desayuno immak-s-bukwa**<sup>14</sup>  
breakfast make-PFV-PROG.COLL  
'[They all] had breakfast.'  
(June 26, 2008, rec. 11, 5:44)

Similarly, a subset of the outer affixes can be organized into a fixed ordering, as shown in (15). However, for this group of affixes, the transitive ordering pattern is only reliable as long as certain other affixes do not intervene; this issue is discussed in section 3.

(15)	OUT <sub>1</sub>	OUT <sub>2</sub>	OUT <sub>3</sub>	OUT <sub>4</sub>
	-suli	-mala	-bali	-sunna
			-moga	
	NEG	PL	'again'	'truly'
			'also'	

Examples (16)-(17) show the ordered pairs *mala-bali*, *suli-moga*, *mala-moga*, and *suli-bali*.

- (16) **sii=mar-bali-d**  
sit=PL-again-RHET  
'[Those other ones] are sitting there too.'  
(June 29, 2008, rec. 1, 3:50)

<sup>14</sup> The progressive morpheme *-bukwa* has the additional meaning 'in a group' which is abbreviated 'COLL' for collective.

- (17) **gun-bi=sur-moga-d**  
eat-want=NEG-also-RHET  
'I don't want to eat any.'  
(June 26, 2008, rec. 11, 5:29)
- (18) **gu-dii-dii=mar-mo-ye**  
COP-prog-prog=PL-also-RHET  
'They are also [just like me].'  
(June 26, 2008, rec.11, 3:06)
- (19) **gun-sa=sur-ba**<sup>15</sup>  
eat-PFV=NEG-again  
'[We] didn't eat [that chicken] either.'  
(July 2, 2008, rec. 1, 5:20)

Example (20) demonstrates the ordering of *-sunna* after *-moga*.

- (20) **bato sunmak-de=mo-sun-do**  
already speak-INCP=also-truly-RHET  
'[They] are already starting to talk too.'  
(June 26, 2008, rec. 11, 19:40)

For this particular group of outer affixes, the ordering is fixed, as shown in (15).<sup>16</sup> As long as the word contains only the outer affixes in (15), the negative *-suli* will always come before *-bali* or *-moga*, regardless of whether *-mala* is present or not.

The two partial orderings are combined in (21). (Please see (12) and (15) for glosses).

- |      |   |   |   |
|------|---|---|---|
| (21) | inner affixes                                   | = | outer affixes   |
|      | IN <sub>1</sub> IN <sub>2</sub> IN <sub>3</sub> | = | OUT <sub>1</sub> OUT <sub>2</sub> OUT <sub>3</sub> OUT <sub>4</sub> |
|      | -lege -sa -nai                                  | = | -suli -mala -bali -sunna  |
|      | -gwichi   |   | -moga   |
|      | -sii  |   |   |
|      | -mai  |   |   |
|      | -dii  |   |   |
|      | -bukwa  |   |   |

This combined ordering dependably produces grammatical words: if one begins with a stem and adds at most one affix from each position, proceeding from left to right, all of the words constructed will be grammatical. Furthermore, the inner/outer distinction suggests morphological zones similar to those found in templates (Kari 1989). In this sense, the fixed ordering functions as a template. However, this system will only function as long as the negative affix *-oe*, which participates in the exceptional ordering group, is not included.

### 3 Exceptional Ordering Involving the Future *-oe*

The future affix *-oe* disrupts any possible template model of Kuna because it is impossible to assign the affix to any single position in the proposed template. The presence of this affix

<sup>15</sup> *gun-sa* is pronounced /gucha/.

<sup>16</sup> The pair *bali-moga* or *moga-bali* appears to be unattested; the two affixes are in complementary distribution. It is possible that this is the result of the semantic similarity of *-bali* 'again' and *-moga* 'also.'



triggers non-transitivity and non-cumulativity in affix ordering, properties that cannot be described using any type of fixed-ordering analysis.

### 3.1 The Future *-oe* and Non-transitivity

The affix *-oe* is an inner affix as defined by its inability to combine with defective roots. However, unlike most inner affixes, it can combine with roots that are not verbs, as shown in (22).<sup>17</sup>

- (22) war-gwen **nap-oe**  
 CLF.long-one **more-FUT**  
 ‘[There] will [be] one more.’ (unrecorded conversation, Jan. 6, 2009)

Usually, *-oe* appears after other inner affixes and before outer affixes. Example (23) illustrates the ordering *-lege-oe*, where *-oe* appears immediately before the outer affixes.

- (23) uk-**leg-o**=dake-n-ye  
 give-PASS-FUT=see-IMPV-QUOT  
 “‘It will be given out, distributed,’ (they say).” (June 29, 2008, rec. 1, 1:47)

Examples (24) and (25) show *-oe* appearing before the negative *-suli*, an outer affix of the group OUT<sub>1</sub>. As expected, *-oe* appears right before the inner-outer boundary.

- (24) nu-gu-**o**=sur-i-ye  
 good-COP-FUT=NEG-QUOT  
 “‘[He] won’t get better,’ (people told me).” (June 29, 2008, rec. 1, 26:40)

- (25) edarb-**oe**=sur-sun-dake-n-ye  
 wait-FUT=NEG-truly-see-IMPV-QUOT  
 “‘[I] really won’t wait [for you],’ (she said).” (July 2, 2008, rec. 1, 1:00)

As expected, the affix *-oe* also appears before outer affixes that come later in the word, such as *-dibe*, as shown in (26).

- (26) sog-dag-**o**=dibe-ye  
 say-come-FUT=COND-QUOT  
 “‘[What] will [she] say [to me]?’ (I wondered).” (July 2, 2008, rec. 1, 0:03)

However, the future affix *-oe* also appears *after* certain outer affixes, even though it is an inner affix. The unusual behavior of *-oe* has been noted by Sherzer (1989:265): “when the future affix *oe* [position 2] occurs along with *pali*, *mala*, or *moka* [position 3], it follows them.” Examples (27) and (28) show how *-oe* can come either before or immediately after the plural *-mala* in different contexts (it can never appear immediately before *-mala*). The symbol ‘=’ is

<sup>17</sup> The suffix *-oe* is also unusual in other ways, being one of very few vowel-initial suffixes, and the only suffix comprised entirely of vowels. While stress in verbs usually falls on the penultimate syllable, it never falls on *-oe*, and may shift to the antepenultimate syllable in order to avoid falling on *-oe*.

still placed before the first outer affix, even if *-oe* appears after an outer affix.

(27) dak-**o**=sur-**mar**-iye  
 see-FUT=NEG-PL-QUOT  
 “[You]-PL won’t see [him] anymore,” (he said).’ (June 29, 2008, rec. 1, 23:16)

(28) oyo-na=**mal**-**oe**  
 show-go=PL-FUT  
 ‘[They] will go show [the place to you].’ (June 29, 2008, rec. 1, 37:08)

This effectively destroys the fixed-ordering system described in section 3, because there is no way to fit the affix *-oe* into the fixed partial ordering shown in (26). The affix *-oe* is occupying two different non-adjacent positions in the template, making the ordering non-transitive, which contradicts the basic structure of template morphology.

The affixes *-moga* ‘also’, *-oe*, and *-bali* ‘again’ behave similarly to *-mala* in terms of their ordering with respect to *-oe*. Examples (29) and (30) illustrate the behavior of *-moga* and *-oe*:

(29) na=**mog**-**oe**-na  
 go=**also**-FUT-IMPV  
 ‘They were also going to go.’ (June 29, 2008, rec. 1, 12:48)

(30) gu-**o**=sur-**mo**-ye  
 become-FUT=NEG-**also**-QUOT  
 “[You] will not [get yourself tied up] either,” (he said).’ (Kungiler 1997:35)

Examples (31) and (32) illustrate the pair *-bali*, *-oe*. Note that the sequence of morphemes in example (32) is rare in conversation because the same meaning is often expressed using *bali* as a separate word preceding the verb, especially when *-suli* is present (see examples 54, 59, 60, and 64 in the appendix). Example (32) is repeated with additional context as example (65) in the appendix.

(31) dani=**mar**-**bal**-**oe**-ye  
 come=PL-again-FUT-QUOT  
 “[We] will come back,” (they said).’ (June 26, 2008, rec. 11, 8:41)

(32) na-**o**=sur-**bali**-ye  
 go-FUT=NEG-**again**-QUOT  
 “I won’t go either,” (I said).’ (Aug 15, 2010, rec. 4, 4:35)

Example (31) also illustrates how *-oe* can appear after the combination *-mala-bali*. In general, the affixes *-mala*, *-bali*, and *-moga* have the same ordering properties with respect to *-oe*, and when two of them appear together, they appear adjacent to each other in the order shown in (15)/(21), regardless of the position of *-oe*.

The affix *-sunna* may appear either immediately before or immediately after *-oe*, and it always appears last when combining with *-mala*, *-moga*, or *-bali*. In example (33), it appears after *-mala* and before *-oe*. Note that the outer affix *-mala* is attached to a non-verbal root.

- (33) bane=mar-**sun-oe**  
 tomorrow=PL-**truly-FUT**  
 ‘[See you] tomorrow, for sure.’ (unrecorded conversation, Jan. 6, 2009)

In example (34), *-sunna* appears after *-oe*:

- (34) iki an totok-**o=sun**<sup>18</sup>  
 how 1ST play-FUT=**truly**  
 ‘How should I dance?’ (Sherzer 2004:34)

The ordering of *-sunna* with respect to *-oe* is unusual for Kuna, in that the two affixes can appear adjacently in either order. However, cross-linguistically, variable ordering of adjacent affixes is relatively common, and it is easier to account for than variable ordering between non-adjacent positions. The ordering of *-sunna* and *-oe* can be explained with a fixed partial ordering simply by locating the two affixes in the same position class, although *-oe* will still need to appear in two positions for other reasons. For this reason, the variable ordering of *-oe* and *-sunna* does not pose as much of a problem as does *-oe*’s interaction with *-mala*, *-moga*, and *-bali*.

While some template models tolerate variable ordering, it is only possible within one zone or between adjacent zones. In the Kuna situation, variable ordering does not even respect the boundaries between the two major zones of the proposed template. Aside from the non-transitive ordering, there are also some other reasons why a fixed ordering may not be the most appropriate model. The principal attraction of describing certain languages in terms of templates is that templates model blocking within position classes. *Blocking* in this context refers to situations in which semantically compatible affixes cannot co-occur. This phenomenon can be explained by assigning the two affixes to a single position class, such that only one affix in the class can appear in any given word. It effectively explains complimentary distribution of affixes, as long as they are not separated by intervening template positions. Kuna has little or none of this type of blocking. Affixes that “block” each other in Kuna generally do so for semantic reasons; for example, only one of the six progressive affixes may appear in any given word. The template hypothesis offers us little advantage in this respect.

A level ordering analysis would not be the best fit either. The principal attraction of a level ordering analysis (Kiparsky 1982) is that it can be used to correlate affix order with independent features such as phonology. In the case of Kuna, there are no phonological reasons for assigning affixes to a given level; affixes must be assigned to levels based on their ordering properties alone.<sup>19</sup> Furthermore, the non-transitive ordering poses the same problem that it does for the template model, in that it would require looping between levels. Another potential problem with

<sup>18</sup> Sherzer’s orthography uses single /p,t,k/ for single (voiced/voiceless) stops.

<sup>19</sup> Kuna affixes are vowel-final, and the final vowel is deleted before the addition of another affix. If the process results in a three-consonant cluster, then the consonant preceding the deleted final vowel is deleted as well. Some affixes have irregular short forms, where the entire final syllable is deleted even though no consonant cluster is being avoided. Four affixes never undergo truncation: the perfective inner affix *-sa*, the outer affix ‘possibly,’ *-dibe* or *-diba*, the conditional outer affix *-le* and the quotative outer affix *-ye*. In the case of *-dibe/-diba*, the lack of truncation may be in order to avoid homophony or near-homophony with the nominalizer *-di*. In the other cases, the lack of truncation appears to be due to the affixes’ unusually reduced phonological form. The last two of the group, *-le* and *-ye*, not only resist truncation but also fail to trigger truncation of immediately preceding affixes. The imperfective *-na* also fails to trigger truncation.

using level ordering for the Kuna data is bracket erasure. According to bracket erasure, an affix attaches to the word as a whole, without reference to specific features of affixes within the word. Since Kuna affixes appear to be very sensitive to adjacency, this may pose some problems. Some affixes, especially within the inner affix group, may attach to one affix in a given position class, but not another. For example, an alternative perfective marker *-de* only appears on the verb *nae*, ‘go,’ and not on other verbs. Kuna morphology has too many morpheme-specific conditions to be modeled using rules that can only refer to classes of words or affixes.

While some aspects of Kuna morphology are describable using a template or level-ordering analysis, these theories cannot adequately explain its non-transitive ordering properties. At the same time, the Kuna data does not contain the types of complications that these theories are best suited to explain.

### 3.2 The Exceptional Affixes and Non-cumulativity

The variable ordering triggered by *-oe* is also non-cumulative. Here, cumulativity means that a word made up of grammatical pairs of affixes (bigrams) is a grammatical word. In other words, if a word *stem-a-b* is grammatical and a word *stem-b-c* is grammatical, then the word *stem-a-b-c* is also grammatical. Furthermore, if the word *stem-b-c* is grammatical and the word *stem-c-a* is grammatical, then the word *stem-b-c-a* is also grammatical.

For many groups of affixes in Kuna, such as those shown in the partial ordering in (21), cumulativity holds. However, cumulativity breaks down when the the affix *-oe* is involved. In (35), a summary of the grammatical adjacency pairs is shown:

- (35) *-oe-suli*  
*-suli-mala,    -suli-bali,    -suli-moga*  
*-mala-oe,    -bali-oe,    -moga-oe*

If Kuna were a cumulative system, then all of the following orders would be grammatical:

- (36) a.        stem-**oe=suli-mala**                stem-oe=suli-bali                stem-oe=suli-moga  
           b.        stem=**mala-oe-suli**                stem=bali-oe-suli                stem=moga-oe-suli  
           c.        \*stem=**suli-mala-oe**                \*stem=suli-bali-oe                \*stem=suli-moga-oe

However, the orders in (c) are ungrammatical. Orders (a) and (b) are illustrated in (37), repeated from (27), and (38).

- (37) dak-**o=sur-mar-ye**    (order a)  
       see-FUT=NEG-PL-QUOT  
       ‘‘You-PL won’t see [him] anymore,’’ (he said).’    (June 29, 2008, rec. 1, 23:16)

- (38) na=**mal-o-suli**                (order b)  
       go=PL-FUT-NEG  
       ‘[The children] won’t go [to school tomorrow].’    (July 3, 2008, rec. 2, 7:08)

Although the corpus is limited, it appears from both the corpus and the elicitations that order (a) is used more often than order (b). While neither form is frequent in the corpus, order (b) is not used at all in the published texts. In the translation elicitations, some consultants used only order

(a), while all of those who used order (b) also used order (a). In the conversational elicitations, order (a) was used more frequently (see appendix). Order (c) is so far unattested in the corpus and was not produced spontaneously in elicitation sessions. However, a minority of consultants in elicitation sessions accepted order (c) when I produced a word using this order. This means that order (c) is more grammatical than, for example, order (d) *\*stem-oe-mala-suli*, which contains no grammatical ordered pairs. There seems to be a continuum of grammaticality  $a > b > c > d$ , where (a) is at the top, and (c) and (d) seem to be below a threshold of utterability. According to Coetzee (2008), the grammatical words of a language may differ in their degree of grammaticality, where the more highly grammatical words violate fewer constraints than the marginally grammatical words. Using a response-time experiment, Coetzee shows that the less grammatical words have longer processing times. Although there is no data on processing in Kuna, the frequency of bigrams may be correlated with relative grammaticality and frequency of bigrams.

The fact that (c) is ungrammatical makes the ordering system non-cumulative. This non-cumulativity is demonstrated using finite-state diagrams constructed from the bigrams listed in (35). In order to form a grammatical word, begin at the stem and follow any arrow. Continue following any of the arrows from one node to the next, stopping at any point, but never going back or jumping between nodes. If the Kuna system were cumulative, the diagram would show a closed loop of affixes, as in Figure 1.

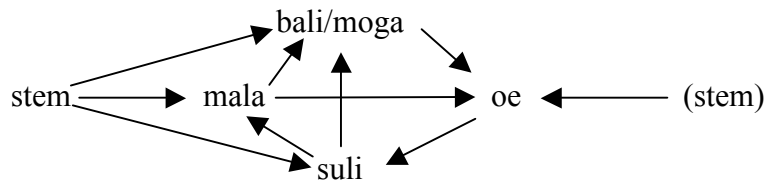


Figure 1: Hypothetical language with cumulative ordering

However, figure 1 does not describe Kuna. It can account for all of the data presented in section 2 (fixed partial ordering) and section 3.1 (non-transitive ordering), but it cannot account for non-cumulativity, incorrectly generating forms such as *\*stem-suli-mala-oe*. In Figure 2, this problem is solved by using more than one copy of a single affix.

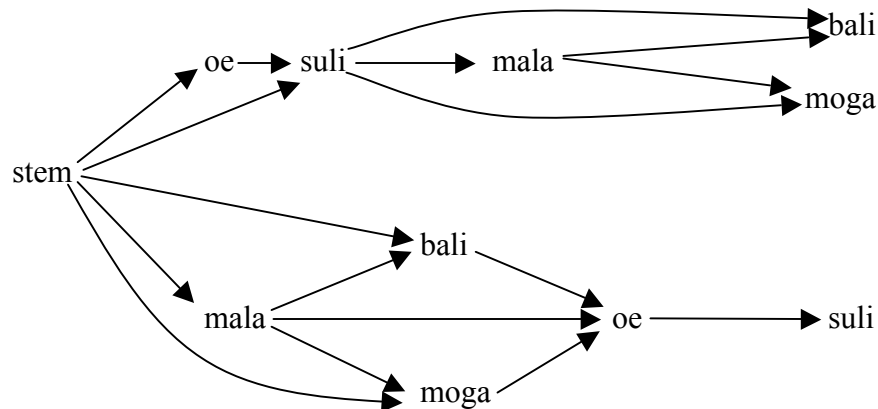


Figure 2: Non-cumulative ordering in Kuna

Figure 2 is an effective way of determining which combinations of affixes are grammatical. However, the system is too powerful, in that it is essentially a way of dictating which strings are grammatical. Also, figure 2 does not capture the similarities in the data; instead, it uses redundant structures to model the same phenomenon in two different contexts.

To eliminate the copies and use figure 1, the system must somehow remember what path was taken to get to the present node, so that the word can be ended to avoid creating an ungrammatical string such as *\*suli-mala-oe*. In other words, constraints must be non-local. This is not possible in a finite-state model.

## **4 Local Analyses of Kuna Affix Order**

### **4.1 Selectional Restrictions**

Setting aside non-cumulativity for the time being, non-transitivity can be accounted for using a local analysis that constrains only adjacent combinations of affixes rather than the structure of the verb as a whole. The analysis draws on research on English by Fabb (1998). Fabb (1998) argues that selectional restrictions are more effective at predicting English suffix ordering than is level ordering, which incorrectly predicts the grammaticality of a number of ungrammatical suffix strings. In Fabb's analysis, the selectional restrictions are inviolable constraints on the behavior of individual suffixes. Some of the constraints determine whether or not a suffix can attach to an already-suffixed word, and some determine which major category a suffix can attach to. These two types of selectional restrictions explain the majority of the suffix-ordering data in English. The remaining data is explained by a group of selectional restrictions that refer to the identity of the individual suffix at the end of the base form. Fabb (1998:538) argues that his selectional restrictions make level-ordering "redundant," since it does "no extra work" that is not accomplished by the selectional restrictions. Of course, a selectional-restrictions account is only preferable to the extent that it makes correct predictions about a larger portion of the data; if level ordering were equally effective, then the additional predictive power of the selectional restrictions would be unnecessary.

The bigram constraints proposed for Kuna are similar to the subset of Fabb's selectional restrictions that are morpheme-specific, in that they determine whether or not a given affix may attach to a base that ends in a certain morpheme. Unlike Fabb's analysis, the analysis of Kuna does not include broader selectional restrictions based on major category, although the low-ranked alignment constraint does refer to membership in the categories of inner and outer affixes. The selectional restrictions that are sensitive to affixes in the base are fundamentally local constraints, in that they only apply to the last affix in the base and do not make reference to any features of the base word as a whole.

Morpheme-specific selectional restrictions such as those in Fabb (1998) and the constraints proposed for Kuna are theoretically very different from the rules that govern affixation in a level-ordering system. In level ordering (Kiparsky 1982), bracket erasure effectively means that it is impossible for an affix to be sensitive to the presence of individual affixes in the base. Although the data from English suffixation shows that certain affixes attach to words ending in affix *-a* but not words ending in affix *-b*, this behavior is explained in terms of the base's location at a given level as it proceeds through the level-ordering derivation. In order to introduce constraints that

are sensitive to specific affixes in the base, a serious modification to Lexical Phonology is necessary. Hammond (1992) introduces this change to the theory of affixation, naming it *morphemic circumscription*. According to Hammond, morphemic circumscription “allows affixes to be attached to a peripheral morphological constituent of the word” (1992:195). In other words, rather than selecting for an entire base, affixes can select for individual affixes within a base, provided that they are at the edge. Hammond justifies adding this power to current affixation theories by presenting various types of examples, including bracketing paradoxes and affixation that is contingent on prosodic characteristics of affixes within the base. Although Hammond does not propose using morphemic circumscription for non-transitive ordering effects, it is important for describing the Kuna data, because it allows for affixation that is sensitive only to peripheral affixes of the base. In this sense, morphemic circumscription is a local method of word-formation, similar to the morpheme-specific selectional restrictions of Fabb (1998).

In some ways, local selectional restrictions are more restrictive than global selectional restrictions such as those based on major category or derivational level. Each selectional restriction determines the order of a particular pair of affixes rather than simply providing a general guideline for which types of bases an affix can attach to. For a language that exhibits transitivity, any account based on global selectional restrictions can also be described using only morpheme-specific selectional restrictions. However, there are also ways in which a local account is less powerful than a global account, giving the language more room for variation. In particular, a local account allows for non-transitivity in affix ordering, because it does not make any statements about the ordering of affixes that are non-adjacent: if the string *-a-b* is grammatical and *-b-c* is grammatical, then a local account makes no statements about the grammaticality of *-a-x-c*. In terms of the Kuna data, this is an argument in favor of morpheme-specific selectional restrictions.

The data in section 3 has shown that it is impossible to build a fixed, transitive global ordering of the Kuna affixes. However, we can characterize the data in terms of the grammaticality or ungrammaticality of adjacent pairs of affixes. An ordered pair of affixes is considered grammatical if it is attested in any context, although it may be unacceptable in some contexts due to non-cumulativity. This may seem to weaken the claim that every pair is either grammatical or ungrammatical. However, as discussed in section 3.1, an ungrammatical word constructed completely of grammatical pairs is much more acceptable than any word in which an ungrammatical pair appears. This is an important point in favor of the importance of adjacency in Kuna affix ordering. For the purposes of this chart, a pair is considered grammatical if it appears in any grammatical word.

In table 1, the affixes listed on the vertical axis represent the first member of a pair, and the affixes listed on the horizontal axis represent the second member of a pair; the inner-outer affix boundary is indicated with a thicker line. The cell at the intersection of a column and a row represents the relevant ordered pair. Cells are marked with a  $\surd$  to indicate that the ordered pair in question is attested. Cells left empty indicate that the pair is unattested; pairs may be unattested either for semantic or morphological reasons.<sup>20</sup> Note that for a hypothetical language with perfectly transitive morphology, all of the cells above the diagonal would be checked, and all of the other cells would be empty, assuming that each affix is at a different level in the transitive ordering (in fact, *-moga* and *-bali* would be at the same level). To the extent that table 1 does not follow this pattern, a transitive or template model is inappropriate for describing Kuna

<sup>20</sup> *-nai* and other progressive affixes are reduplicated when the subject is plural; *-mala* ‘PL’ is optional in these forms.

morphology.

In order to use the table to evaluate the grammaticality of a word, break the word down into ordered pairs of affixes and locate the cell corresponding to each of the pairs. If every cell is checked, then word is evaluated as grammatical. Using this method, the table correctly evaluates the grammaticality of all of the examples presented in sections 2 through 3.1.<sup>21</sup> The table makes no statements about overall ordering, only about adjacent affixes. This means that words that exhibit non-transitivity are evaluated as grammatical, since they consistently contain the same ordered pairs. However, it incorrectly evaluates words that exhibit non-cumulativity as grammatical, namely words with orders of the type shown in (36c).

	lege	sa	nai	oe	suli	mala	moga	bali	sunna
stem	√	√	√	√	√	√	√	√	√
lege PASS		√	√	√	√	√	√	√	√
sa PFV			√		√	√	√	√	√
nai PROG			√	√	√	√	√	√	√
oe FUT					√				√
suli NEG						√	√	√	√
mala PL				√			√	√	√
moga ‘also’				√					√
bali ‘again’				√					√
sunna ‘truly’				√					

Table 1

#### 4.2 Bigram Constraints and the Unexceptional Affixes

In order to formalize the information in table 1 as a generative system, this section proposes a group of local constraints on adjacency. Markedness constraints on ordered pairs of adjacent suffixes have been proposed by Ryan (2008), who calls them bigram constraints. Following Fabb’s (1998) morpheme-specific selectional restrictions and Hammond’s (1992) morphemic circumscription, the bigram constraints determine whether affixation is possible based on the identity of the affix and of the final morpheme of the base. The constraint \**x,y* penalizes the appearance of a pair of adjacent suffixes, or bigram. The constraints are evaluated solely on the basis of adjacency without reference to positioning in the word. Given a constraint \**x,y*, a pair of suffixes -*x-y* located at the beginning of the word will receive exactly the same penalty as the

<sup>21</sup> It makes no statements about some affixes that appear in the conversational data but are not important to our analysis.



pair *-x-y* located at the end of the word; while the sequences *-x-a-y* or *-y-a-x* will not be penalized. In Fabb's (1998) analysis, the morpheme-specific constraints are used to explain residual data that is not covered by broader selectional restrictions. In contrast, for Kuna, morpheme-specific constraints account for the majority of the data. In this sense, this analysis is similar to that of Ryan (2008) who models suffix order in Tagalog using constraints on ungrammatical bigrams.

The bigram constraint analysis's local property allows it to account for various types of non-transitivity in affix ordering. Ryan presents data from Tagalog on a suffix which can appear in either of two non-adjacent positions; this can be modeled by bigram constraints (Ryan 2008:18). Bigrams can also account for a "context-sensitive reorderability," in which two affixes with the order *a-b* can also appear in the order *b-a*, but only in certain morphological contexts (p. 19). Bigrams can be used to account for "free variation within a fixed span," in which a certain affix may appear in various different positions in an otherwise transitive ordering structure. This presents an improvement over alignment constraints, which can account for variable ordering only for adjacent affixes, and without context sensitivity.

Of these various ordering phenomena that can be modeled using bigram constraints, the one most similar to the Kuna data comes from suffix ordering in Quechua. Using the Quechua data, Ryan demonstrates how bigram constraints can model a three-suffix "loop," similar to the Kuna loop shown in (35). The possible adjacent orderings in Quechua, taken from Muysken (1981), are given in example (39):

- (39) a. *-schi-naya* (also *-naya-schi*)  
 b. *-naya-ru*  
 c. *-ru-schi* (Ryan 2008:21)

Ryan successfully models this situation using the constraint ranking in (45):

- (40) *\*-ru-naya, \*-schi-ru* >> *\*-naya-schi, \*schi-naya* (Ryan 2008:21)

All of the ungrammatical forms can be ruled out using the two high-ranked constraints. The low-ranked constraints, which penalize grammatical orderings, are included in order to generate the variable results shown in (39a). Ryan's bigram analysis effectively accounts for the non-transitivity found in Quechua.

### 4.3 Using Bigram Constraints to Model Non-transitivity

Bigram constraints are ideal for modeling the non-transitivity exhibited in the Kuna data, which is similar to the Quechua example. If the data is limited to words containing single bigrams, the analysis is very simple, using only inviolable constraints. Examples (41)-(43) are representative of the situation of non-transitivity:

- (41) *dak-o=suli*  
 see-FUT=NEG  
 'will not see'
- (42) *dak=sur-mala*  
 see=NEG-PL

‘do not see’

- (43) dak=mal-oe  
 see=PL-FUT  
 ‘will see (PL)’

In order to account for these examples, the following constraints on adjacent affixes are necessary:

- \*suli-oe
- \*oe-mala
- \*mala-suli

The constraints are top-ranked, inviolable constraints. The very simple tableau 1, where all constraints are top-ranked, shows how these constraints account for example (41); examples (42) and (43) can be accounted for similarly. Other basic constraints are assumed to be active and top-ranked, including MAX, DEP, and ALIGNROOT-L.<sup>22</sup>

see (dake) FUT (oe) NEG (suli)	*suli-oe	*oe-mala	*mala-suli
☞ (a) dak-o-suli			
(b) dak-sul-oe	*!		

Tableau 1

This shows that it is simple to account for the single-bigram (*root-a-b*) words using bigram constraints.

A system of bigram constraints can be built up to account for all other words with unexceptional orderings, such as all of the examples in section 2. In order to do this, the data shown in table 1 is used to generate inviolable constraints against all unattested adjacency pairs. This is a cumbersome system, but it can describe both the unexceptional pairings and the non-transitive pairings.

It is a little more complicated for bigram constraints to account for the three-affix words (*root-a-b-c*) that exhibit non-transitivity. The forms (44a-c) are representative of these words:

- (44) a. dak-o=sur-mala  
 see-FUT=NEG-PL  
 ‘will not see (PL)’
- b. dak=mal-o-suli  
 see= PL-FUT-NEG

<sup>22</sup> Note that the input form for our OT tableau is semantic. The winning candidate must have some exponent of each of the semantic elements that appear in the input form (in other words, the constraint MAX-MEANING is top-ranked). If there is more than one affix that can represent the meaning, the input form does not specify which should be used. As it turns out, for the data in tableaux 1-3, there is only one possible exponent for each semantic element.

‘will not see (PL)’

- c. \*dak=sur-mal-oe  
 see=NEG-PL-FUT  
 intended: ‘will not see (PL)’

Because bigram constraints only apply to adjacent affixes, a word of the form *root-a-b-c* is evaluated as two separate bigrams, *-a-b* and *-b-c*. If all three trigrams shown in (44) were grammatical, it would be easy to account for the data using the bigrams introduced so far. However, (44c) is in fact ungrammatical in Kuna. This non-cumulativity distinguishes the Kuna data from Ryan’s Quechua data, and requires a different type of analysis.

#### 4.4 Using Bigrams to Model Non-cumulativity

According to Ryan (2008), the bigram constraint system does not account for the type of non-cumulativity we have identified in the Kuna data in section 3.2: “bigrams cannot model a scenario in which a trigram is illformed but both its constituent bigrams are independently wellformed” (Ryan 2008:24). This statement is true for Ryan’s analysis, which uses Maximum Entropy Grammar instead of classic OT. Ryan’s use of weighted constraints and a smoothing factor means that all trigrams composed of grammatical bigrams are predicted to occur at least a very small percentage of the time. However, in a classic OT tableau, the statement quoted above no longer applies. This is because classic OT uses a categorical ranking system, so that candidates that violate high-ranked constraints are predicted to be completely unattested.

In tableau 2, the three high-ranked constraints are equally ranked, and the two low-ranked constraints are equally ranked. This ranking generates the two grammatical orderings (a) and (b) while ruling out the ungrammatical (c). The high-ranked group is comprised entirely of constraints against ungrammatical bigrams, and the low-ranked group is comprised of constraints against grammatical bigrams. Tableau 2 concerns only the three affixes *-oe*, *-suli*, and *-mala*. In order to handle data using *-moga* and *-bali*, the constraints used would be the same as those used in tableau 2, except that *-mala* would be replaced by *-bali* or *-moga*. In the case of words with more than one of the adverbial affixes, it would be necessary to add the top-ranked constraints *\*moga-mala*, and *\*bali-mala*.

see (dake) FUT (oe) NEG (suli) PL (mala)	*sul-oe	*o-mala	*mala-suli	*mala-oe	*suli-mala
☞ (a) dak-o-sur-mala					*
☞ (b) dak-mal-o-suli				*	
(c) dak-sur-mal-oe				*	*!
(d) dak-sul-o-mala	*	*!			
(e) dak-mar-sul-oe	*		*!		
(f) dak-o-mar-suli		*	*!		

Tableau 2

This analysis accounts for the grammaticality of (a) and (b) and the ungrammaticality of (c). However, there is no independent confirmation of the existence of the low-ranked constraints on grammatical bigrams: why should *\*mala-oe* and *\*suli-mala* have an effect on the data, but not *\*oe-suli*?

Furthermore, there is no way of determining which of the two grammatical outcomes will surface in any given context. Assuming that the variation is random, then the situation can be modeled using stochastic OT (Bresnan, Dingare, and Manning 2001). According to this theory, as in traditional OT, constraints are ranked along a continuum from high to low, with higher constraints outranking lower ones. However, rather than occupying a particular point on the continuum, each constraint occupies a probabilistic cloud of locations, such that the constraint is most often ranked near the center of its range, but sometimes appears further away from the central point. Every time a word is generated, each constraint may appear at a slightly different location on the continuum. If two constraints are relatively close on the scale, then there is a low probability that the “lower” constraint will outrank the “higher” constraint in some instances of the grammar.

Using this theory to explain the data from Kuna, it would be necessary to propose that the constraints *\*-suli-mala* and *\*-mala-oe* are very near each other on the continuum, with the center of distribution of *\*-mala-oe* ranked higher than that of *\*-suli-mala*. In most instances of the grammar, *\*-mala-oe* ends up being ranked higher; however, in some instances, when *\*-mala-oe* is relatively low and *\*-suli-mala* is relatively high, they cross. In these cases, *\*-suli-mala* turns out to be ranked higher, allowing (b) to appear as grammatical. If these low-ranked constraints against grammatical bigrams are indeed driving the grammaticality of the two-bigram forms, then there may be evidence for the existence of these constraints in other areas of the grammar. The corpus study discussed in section 5 is an attempt to find such evidence.

## 5 Corpus Study

Section 4 raises the question of whether there is independent evidence for the existence of bigrams as a driving force in Kuna grammar. Hay and Baayen (2002) show that frequency can be used as an indicator of the productivity of an affix. They propose that if a given English suffix appears most often in highly parsable words, it is more productive. As a measure of parsability, they compare the frequency of a word with the frequency of its unaffixed base. They establish a threshold of relative frequency called the parsing line, based on comparing data on relative frequency to a study of response times. If the frequency of an affixed form is relatively high compared to the frequency of the unaffixed form, the word will fall below the parsing line, meaning that it is less likely to be parsed by speakers. Highly parsable words are words whose unaffixed base is relatively likely to appear as an independent form. The affixes of these words are those that are most likely to appear with a variety of bases. The study effectively establishes the idea that a frequency study of affixes can help us predict which base-affix combinations are likely to be grammatical.

There is no response-time data for Kuna, but frequency data is extractable from the corpus. The frequency of a bigram *-a-b* is compared with the frequency of words in which the two affixes appear in a different order, either *-a-x-b* or *-b-x-a* (in most cases *-b-a* is nonexistent). The hypothesis is that when two members of a bigram appear in a word, they are highly likely to appear as a bigram and not in some other order. This result will give support to the assertion that bigrams are important in Kuna grammar and that in some sense, they exist as composite units within the verb word.

The study also examines the relative frequencies of different bigrams in order to compare them to the ranking of bigram constraints in section 4.4. The top-ranked bigram constraints are inviolable and the corresponding bigrams are completely unattested. However, in a word with three affixes, the grammar has a choice of three different affix orders that all obey the inviolable constraints. In this case, the hypothesis is that the speaker will choose a word containing the more frequent bigrams. For a highly frequent bigram *-a-b*, if *-a* and *-b* both appear in a given word, then they are highly likely to appear as the ordered bigram *-a-b* rather than in any other order.

The corpus study uses five published Kuna texts collected by Joel Sherzer (Sherzer 1998, 2004).<sup>23</sup> All of the texts are spoken texts, and all but one are narratives. Kuna has various specialized registers whose vocabulary and phonology differ from those of the conversational language. Although it is unlikely that the affix order also differs, the survey is limited to narratives in the everyday register in order to avoid increasing the number of variables. The data includes all allomorphs and all senses of each affix. In the case of *-bali*, homophonous morphemes glossed ‘to, towards,’ and ‘with’ were excluded; the other affixes do not have homophones. Affixes appearing as separate words were not included. The search was not limited to forms whose roots were verbs; however, the great majority of the roots are verbs.

Table 2 shows the number of tokens of each affix in the texts.

morpheme	gloss	Text 1	Text 2	Text 3	Text 4	Text 5	total
<b>-sunna</b>	<b>truly</b>	126	86	22	78	99	411
<b>-mala</b>	<b>PL</b>	73	5	141	95	10	324
<b>-oe</b>	<b>FUT</b>	93	22	78	79	28	301
<b>-suli</b>	<b>NEG</b>	29	16	73	57	7	182
<b>-bali</b>	<b>again, too, back</b>	8	17	17	53	28	123
<b>-moga</b>	<b>also</b>	17	3	15	45	10	90

Table 2: Corpus frequencies of selected Kuna suffixes

Table 2 shows that *-oe*, *-mala*, and *-sunna* are the most frequent of the six affixes in question. Note that *-mala* appears as the plural marker on many nouns. As for *-sunna*, it appears more frequently in the corpus than it does in ordinary conversation, because the corpus is comprised as narrative texts, and the repeated use of *-sunna* is a common rhetorical device in narratives.

Table 3 shows data on all of the words that contain at least two of the affixes *-oe*, *-suli*, and *-mala/-moga/-bali*. It combines the data for the affixes *-bali*, *-mala*, and *-moga*, because they all have similar behavior with respect to *-oe* and *-suli*. In the table, *-bali*, *-mala*, or *-moga* is represented by *x*. Data on *-sunna*, which has different ordering properties, is not included. The column marked ‘total’ shows the total number of words containing the two affixes in question, regardless of their position in the word. The column marked ‘adjacent’ shows the number of times that the affixes appear adjacent to each other. The adjacent pairs always appear in the order shown; there are zero tokens of adjacent pairs with reversed order for these three bigrams. The

<sup>23</sup> The texts are *The One-Eyed Grandmother* from Sherzer (2004) and *The Hot Pepper Story*, *Muristo Counsels a New Chief*, *The Report of a Kuna Medicinal Specialist*, and *The Agouti Story* from Sherzer (1998). *Muristo Counsels a New Chief* is the non-narrative text included in this study.

column marked ‘non-adjacent, same order’ lists the number of times that the affixes appear in the same order, but separated by one or more affixes. For example, the pair *-mala-oe* may appear as *-mala-moga-oe*.<sup>24</sup> The column ‘non-adjacent, reversed,’ lists the number of times that a pair of affixes appears non-adjacently in reversed order; for example, *-mala-oe* may appear as *-oe-suli-mala* (in fact, this is the only possible string where *-mala* and *-oe* appear in reversed order).

bigram	adjacent	non-adjacent, same order	non-adjacent, reversed	total
<b>-oe, -suli</b>	10 (83%)	2 (17%)	0 (0%)	12
<b>-suli, -x</b>	16 (94%)	0 (0%)	1 (6%)	17
<b>-x, -oe</b>	47 (87%)	5 (9%)	2 (4%)	54

Table 3: Corpus frequencies of bigrams involving *-oe*, *-mala/-moga/-bali (-x)*, and *-suli*

The most frequent combination is *-mala*, *-moga*, or *-bali* followed by *-oe*. Less frequent are *-oe-suli* and bigrams composed of *-suli* followed by any one of the affixes *-mala*, *-moga*, or *-bali*. If any two of these three affixes appear in the same word, they are highly likely to occur as the appropriate bigram *-o-suli*, *-sur-mala*, or *-mal-oe*. They are unlikely to occur non-adjacently in either order, and they never occur adjacently in reversed order. In this sense, the corpus study supports the hypothesis that bigrams are important to affix ordering.

However, in section 4.4, the violable constraints *\*mala-oe* and *\*suli-mala* were ranked higher than *\*-oe-suli*. This would suggest that combinations like *-mala-oe* would be less frequent in the corpus, and *-oe-suli* more frequent. This seems to show that the corpus study does not provide support for the frequency hypothesis. One reason for the relatively high frequency of *-x-oe* could simply be that the combination contains both *-oe* and *-mala* which are the two highest-frequency affixes of those listed in table 2.

Note that a similar count of combinations of *-sunna*, *-suli*, and *-oe* shows similar results as for the other adverbials. The main difference is that in the case of *-sunna* and *-oe*, the reversed order is possible. There is no inviolable constraint against the combination *-oe-sunna*, so it occurs in about one-quarter of words containing the two affixes.

## 6 The Role of Focus and the Inner-Outer Affix Boundary

The data from the corpus study supports the idea that bigrams are important in Kuna morphology, but the frequency of the bigrams in the corpus does not provide any support for the use of low-ranking constraints against grammatical bigrams. The new analysis presented in this section differs from the previous analysis only in the area of the lower-ranked constraints. It retains the top-ranked constraints against ungrammatical bigrams, which still provide a perfect account of all of the single-bigram forms (*root-a-b*) as well as any longer forms that do not exhibit non-cumulativity. However, in order to better account for non-cumulativity in the double-bigram forms (*root-a-b-c*), the lower-ranked bigram constraints are replaced by an alignment constraint.

<sup>24</sup> These non-adjacent, same order forms never appear for the pair *-suli-mala* because of the cumulative effect of a group of top-ranked bigram constraints. For all affixes *-x* there exists a top-ranked bigram constraint either *\*-suli-x* or *\*-x-mala*.

## (45) ALIGNINNER-OUTER:

This constraint penalizes candidates that violate the inner-outer boundary by containing outer affixes that are ordered before (to the left of) an inner affix. The constraint is gradient: if one outer affix is ordered before an inner affix, the candidate receives one violation. If two outer affixes are ordered before an inner affix, the candidate receives two violations, etc.

The classes of inner and outer affixes are those defined in section 2. In short, inner affixes attach only to verb stems, while outer affixes may attach to any root, and may also appear as independent words. According to this definition, *-oe* is an inner affix. It is in fact the “rightmost” inner affix, in that for every inner affix *-x*, there is a top-ranked constraint *\*-oe-x*.

Note that constraint does not specify a stronger penalty for having two inner affixes ordered after an outer affix. The penalty for such candidates will never determine the outcome of a tableau, since all such candidates ruled out by inviolable bigram constraints before they reach the level of ALIGNINNER-OUTER. These bigram constraints have not been shown in tableau 3 because they involve morphemes that are not included in the input.

The constraint ALIGNINNER-OUTER replaces the lower-ranked constraints on grammatical bigrams in the constraint hierarchy:

(46) *\*suli-oe, \*oe-mala, \*mala-suli* >> ALIGNINNER-OUTER

Tableau 3 using this ranking shows that form (a) is the winner, while (b) is a runner-up. Since (b) is actually attested, a system in which the runner-up candidate could sometimes win would be preferable. However, stochastic OT is not a possibility because there is only one low-ranked constraint.

see (dake) FUT (oe) NEG (suli) PL (mala)	*sul-oe	*o-mala	*mala-suli	ALIGNINNER-OUTER
☞ (a) dak-o-sur-mala				
(b) dak-mal-o-suli				*
(c) dak-sur-mal-oe				**
(d) dak-sul-o-mala	*	*!		*
(e) dak-mar-sul-oe	*		*!	**
(f) dak-o-mar-suli			*!	**

Tableau 3

This again raises the question of why order (b) is sometimes grammatical, and whether it is possible to predict when it will occur. Clearly, both (a) and (b) have semantics that include the meanings FUT, NEG, and PL; however, there may be subtle differences between the two. For more

than one consultant, order (b) was considered to be more appropriate if it was interpreted as a question with the meaning “Aren’t you going to *x*?” This was often given as the translation of the out-of-context verb forms with this ordering. This suggests that order (b) has a semantic quality that makes it more appropriate in certain contexts, including when it is being used as a question. A naturally occurring example of order (b) used in another type of question in an unrecorded conversation is given in (47):

- (47) gab=mal-oe o gab=**mal-oe-suli**  
sleep=PL-FUT or sleep=**PL-FUT-NEG**  
‘[Are you] going to sleep or not?’ (unrecorded conversation, Jan. 7, 2009)

An example of the use of order (b) in the recorded conversations is repeated here from example (38):

- (48) na=**mal-o-suli**  
go=**PL-FUT-NEG**  
‘[The children] won’t go [to school tomorrow].’ (July 3, 2008, rec. 2, 7:08)

The context of this utterance is that one (so-called) speaker (myself) was assuming that the children would go to school the following day, but the speaker who produced (43) knew that they would not, because it was a holiday. The speaker who produced the verb was therefore directly refuting the content of the previous utterance.

What does this situation have in common with the use of order (b) as a question? In all three cases discussed, there is an emphasis on the negative. When order (b) is used as a question in (47), it uses an exaggerated intonation expressing surprise and disbelief regarding the possibility that the addressee is NOT going to do *x*. What is at issue is whether or not *x* will happen; in other words, whether or not NEG can appropriately be used to describe the situation. In the case of example (48), it is again at issue whether or not *x* will happen, since there is a temporary disagreement between the speakers over whether NEG can appropriately be used to describe the situation. In short, it appears that in both cases NEG is in focus. In order to show that this is the case, 18 more-or-less spontaneously produced examples of the two different morpheme orders in contexts are given in the appendix, most of which appear to support the hypothesis.

Based on this data, it appears that a focus position exists at the end of the verb word. This is the case at least when *-suli* is at the end of the verb word, and possibly in other cases as well. The focus position can be modeled using an alignment constraint on the location of the focused affix, as shown in (49):

- (49) ALIGNFOC-R: A focused affix appears at the right edge of the word.

This constraint is violated when a focused affix appears somewhere other than the right edge of the word. Note that in this paper, the constraint is only used for cases in which the negative morpheme *-suli* is focused; however, it is possible that it could have a broader application. The constraint is ranked below the bigram constraints, and above ALIGNINNER-OUTER:

- (50) \*suli-oe, \*oe-mala, \*mala-suli >> ALIGNFOC-R >> ALIGNINNER-OUTER

In tableau 4, the input shows that the semantic feature NEG has the feature +FOC. If this were not



the case, then the output would be identical to that of tableau 3. In tableau 4, order (b) is a winner. However, it will only win when NEG is focused. When NEG is not focused, (a) will still win. This means that the analysis can account for the grammaticality of both (a) and (b). The lower frequency of (b) in the elicitations is explained by the fact that it has more specialized semantics than (a). In absence of any context; for example, when translating an isolated sentence from Spanish, speakers are more likely to produce the unmarked form (a); but (b) is not an incorrect response.

see (dake) FUT (oe) NEG (suli) (+FOC) PL (mala)	*sul-oe	*o-mala	*mala-suli	ALIGNFOC-R	ALIGNINNER-OUTER
(a) dak-o-sur-mala				*	
☞ (b) dak-mal-o-suli					*
(c) dak-sur-mal-oe				*	**
(d) dak-sul-o-mala	*	*!		*	*
(e) dak-mar-sul-oe	*		*!	*	**
(f) dak-o-mar-suli		*	*!		**

Tableau 4

This ranking accounts for the grammaticality of (a) and (b) and effectively rules out order (c) because it has two outer affixes ordered before an inner affix. However, there are other forms that do in fact contain two inner affixes ordered before an outer affix, and we need to make sure that the analysis does not rule them out as well. A constructed example representative of these forms is given in (51), and tableau 5 shows it as the winning form (omitting the irrelevant \*sul-oe and \*mala-suli).

- (51) dak=mar-mog-oe  
see=PL-also-FUT  
'They will also see.'

see (dake) FUT (oe) also (moga) PL (mala)	*o-mala	*o-moga	*moga-mala	ALIGNFOC-R	ALIGNINNER-OUTER
☞ dak-mar-mog-oe					**
dak-mo(g)-mal-oe			*!		
dak-o-mo(g)-mala			*!		

dak-o-mar-moga	*!				
dak-mal-o-moga		*!			
dak-mog-o-mala	*!				

Tableau 5

Tableau 5 contains some additional top-ranked bigram constraints because of the introduction of *-moga*, but otherwise the constraint ranking is the same as in tableau 4, with all of the bigram constraints being equally ranked and inviolable. The new constraint ALIGNFOC-R is not active in this tableau because there is no focused affix. Unlike tableau 5, because *-suli* does not appear in the input form, there is no affix that can provide a buffer between *-oe* and *-mala*, the only way that a candidate can avoid violating *\*-oe-mala* is by having the affixes appear in reversed (and non-adjacent) position, even though the presence of *-moga* means that this will result in a double violation of ALIGNINNER-OUTER.

## 7 Conclusion

In the final constraint ranking, constraints against ungrammatical bigrams remain in the highest-ranked position, and are never violated. Constraints on adjacency are clearly a powerful force in Kuna affix ordering, and it is impossible to ignore the fact that the high-ranked bigram constraints are never violated. The bigram constraints alone account for all of the single-bigram forms, and are also consistent with two-bigram (three-affix) data. Furthermore, in terms of token frequency, the bigram constraints account for the great majority of the data: of forms that contain two or more of the six affixes in the study, the great majority contain only two of the affixes, or a single bigram. Non-transitivity is not so much accounted for but ignored by this analysis: it is allowed because most of the constraints are local rather than global.

Given that forms with three of the exceptional affixes are relatively rare in conversation, it is not surprising that there should be some variability in their ordering. When forming a word, speakers always obey the top-ranked bigram constraints. However, if they are still left with some choice in ordering after obeying these constraints, they do not always choose the same order. In order to explain the ordering of these three-affix combinations, two analyses were attempted; the first using low-ranked bigram constraints, and the second using zone-boundary and focus constraints.

The alignment constraint appears to be a better choice than the low-ranked bigram constraints. As shown in section 2, there is robust evidence for the existence of the inner/outer zone boundary in other aspects of the grammar, while there is no independent evidence for the existence of the low-ranked bigram constraints. The surprise in this case is not that the constraint ALIGNINNER-OUTER exists, but rather that it can be violated at all.

The lowest-ranked constraint, verb-final focus, allows us to account for the cases where order (b), which violates the alignment constraint, wins out over order (a). This constraint makes a very interesting claim about Kuna verbs; namely that information structure can influence morpheme order. This is a strong claim supported by little data; the corpus must be expanded in order to provide more evidence for it. It will be especially interesting if morphemes other than the negative *-suli* can be focused in this way.

## 8 Appendix: The Effect of Focus on Kuna Affix Ordering

### 8.1 Introduction

This appendix gives contextualized data on forms containing three of the affixes in question, with the aim of supporting the hypothesis that focus on the negative influences affix order. Because verb forms containing three of the morphemes in question (the negative, the future, and one of the relevant adverbial affixes) are so rare in the corpus, additional forms were obtained through free-form conversational elicitation.<sup>25</sup> Elicitation was carried out by having conversations with speakers about their lives and opinions, so that the context of the verb form would be available for study. In order to avoid priming effects, I avoided using the relevant verb forms, instead using verb-free utterances or starting sentences and hoping that the speakers would finish them. In some cases, the data given comes from unelicited conversations that happened to contain the forms in question. For the data given in this section, please note that lines in italics were spoken by the researcher and should not be taken as data. Because the passages are relatively long, glosses are omitted in the contextualizing sentences.

The conversational data is expected to support the following hypothesis, which is relevant to forms containing three-morpheme combinations of the relevant morphemes (*-oe*, *-suli*, *-mala/-moga/-bali*):

The NEG-final ordering (*-x-oe-suli* or -ADV-FUT-NEG) is preferred over the alternative grammatical ordering (*-oe-suli-x* or -FUT-NEG-ADV) in contexts where the negative is in focus.

Determining whether or not a negative is in focus can be difficult, because it is possible that the only indication of the speaker's decision to focus the negative could be the affix order itself. However, for the purposes of this study, the conversational context will be used as a way of determining whether or not the negative is in focus. The negative is likely to be in focus if the negative statement contradicts or rebuts a positive version of the proposition appearing in the preceding context.

In order to determine whether there is a contrast between negative and positive, examples will be examined for the presence of relevant negatives or positives in the preceding context. The contextualizing sentences need not necessarily appear immediately before the negative form in question, but they must appear within a few conversational turns. The positives sometimes take the form of a question. In some cases, there is both a positive and a negative in the preceding context. These passages also show a large number of uses of the marker *-di*, which I have glossed as CONTR (contrastive). This marker has been identified in Smith (2009) as a subject marker, probably because of the extensional overlap between contrastive topics and overtly expressed subjects. However, it can appear on objects and other arguments as well as subjects. It is used either to highlight a contrast between real-world entities or situations, or to show a shift

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<sup>25</sup> Elicitation sessions were carried out mostly in Kuna Nega, a Kuna town near Panama City. A few of the sessions were carried out in Concepción, another small town near Panama City, and one was carried out in the city center. All speakers were raised in Kuna Yala, where Kuna is the dominant language. Most speakers are bilingual in Spanish and Kuna and have children or grandchildren whose dominant language is Spanish. They use Kuna as their primary language at home and in the community, but are more likely to use Spanish words than speakers living Kuna Yala. Spanish words are not italicized because it is unclear which are borrowings and which are instances of codeswitching. Spanish spelling is used in order to make the words more recognizable to readers.

in conversational topic. While the contrastive marker is relevant to the discussion, it is used so frequently that correlating its distribution with any particular morpheme order is difficult. Furthermore, it is homophonous with the nominalizer *-di*, which can sometimes lead to confusion.

## 8.2 NEG-Final Orderings

The first data set consists of forms with NEG-final ordering. According to the hypothesis, the context of these verbs should highlight a contrast between the negative statement and a corresponding positive proposition.

In the first example, the speaker used one of the forms in question while telling me about a phone conversation. I then turned on the recorder and asked her if she could repeat what she said. The form has the order *mala-oe-suli* (PL-FUT-NEG):

- (52) nanaye, sabadogi an namaloenye, beseye,  
“Mom, we were going to go to you on Saturday,” (I said to her),

emi-di        an    na-mal-o=sur-dakenye.  
now-CONTR 1ST go-PL-FUT=NEG-QUOT  
“but now we will not go.”

gwenad nailikgumaye, uellemadakenye.  
“A relative is lying having been hurt; [she’s] lying sick.” (Aug. 12, 2010, rec. 1, 0:15)

Note that the sentence containing the NEG-final form contains the affix *-di* which combines with *emi* (‘now’ or ‘today’) to form the meaning ‘but instead.’ In example (52), *emidi* signals a contrast between the positive statement ‘we were going to go’ and the negative statement ‘we are not going to go.’ This conforms to the hypothesis that the NEG-final order is found in contexts where negative and positive are contrasted.

In example (53), a contrast is drawn between the positive proposition that gay marriage will be accepted in Panama, and the negative proposition that it will not be accepted in Kuna Yala. The positive proposition is reiterated in the sentence immediately preceding the NEG-final verb form. In this conversation, both A and B are native speakers of Kuna; C is the researcher. The order of morphemes is *mala-oe-suli* (PL-FUT-NEG).

- (53) A: allá en-- bia noticias oyolesad aa, geb nikgunananai, matrimonio, aceptaron.  
Over there in-- where it was shown in the news, [they] just started marrying,  
marriages, [they] accepted it.

B: hombre y hombre?  
A man and a man?

C: eye.  
Yes.

[...]

C: *igi be dake?*  
*How do you see it?*

A: eye, *igi be binsa, neg anmarga gwae gwae o igi?*  
 Yes, what do you think, is everything changing on us, or what?

*igi an sogmoga, eye gwaydapo an sogodo.*  
 What can I say, yes, it's changing, I say.

San Blasgindi sulii; San Blasgindi  
 But not in San Blas; in San Blas

**acceptar-sa=mal-o-suli**  
 accept-do=PL-FUT-NEG  
 [they] won't accept it.

(Aug. 10, 2010, rec. 2, 4:28)

As in example (52), in example (53), the contrastive marker *-di* appears on *San Blas* (Kuna Yala), marking the contrast between Panama (City) and San Blas, and therefore between the positive and negative versions of the statement. Therefore, it seems that this example also conforms to the hypothesis. However, it is important to note that the passage also contains a negative statement immediately preceding the negative form in question.

In example (54), which also has NEG-final ordering, a contrast is established between the positive statement ('I don't mind making molas'), and the negative statement ('young girls won't wear molas anymore'). In this example, there is no contrastive marker *-di*; however, the negative polarity item *bar* 'anymore' is used.<sup>26</sup> This serves to emphasize the contrast between the two propositions, because it contrasts between the past and present generations. The form has the order *mala-oe-suli* (PL-FUT-NEG).

(54) A: *bar bunormala yoobisuli we mor. bar abesuli.*  
 The young girls don't want to wear this mola anymore. [They] don't want [it] anymore.

*soge arbaed bipisuliye.*  
 [They] say it's a lot of work [to make molas].

[...]

*suli! andi arbaed du-- gwen dummad an itoged an, an sae!*  
 No! As for me, I don't feel like it's a lot of work, I do it!

B: *tegite be ... ee ... igi nuga, ee \*yoomarsuli-- yoo--*<sup>27</sup>

<sup>26</sup> When *-bar* (*-bali*) appears as a suffix, it is not a negative polarity item; appearing in both positive and negative constructions.

<sup>27</sup> The form *yoomarsuli* spoken by the researcher is problematic for two reasons: First, the researcher may have primed the speaker by using this verb form, which is the same as the speaker's subsequent verb form except that the future *-oe* is omitted. Second, this form is ungrammatical; the order of suffixes should be reversed.

*Variable Affix Ordering in Kuna*

*Then you ... uh ... what's it called, [they] not wear it ...*

A: bar yoosuli.  
[They] don't wear it anymore.

B: *bar ee, mordina?*  
*Anymore, uh, and the mola?*

A: bar yogguoe gwable. mor yogguoe, win yogguoe, daksa.  
[It] will all be lost. The mola will be lost, the beads will be lost, see.

bar ar yoo=**mal-o-suli**  
again well wear=**PL-FUT-NEG**  
Well [they] won't wear it anymore. (Aug. 8, 2010, rec. 4, 20:27)

This example appears to support the hypothesis. However, as in example (2), there is a statement with a negative meaning immediately preceding the negative form in question.

In example (55), repeated from (38) with additional context, the positive version of the proposition enters the context in the form of a yes/no question. The speaker contradicts the question's suggestion that the children will go to school tomorrow, saying that they will not go to school because there is a holiday. There is no contrastive marker in this example; this would be impossible since the subjects, objects, and settings of both versions of the sentence are identical.

(55) A: *banedsedina escuelase namarmoga ...*  
*And tomorrow, are [they] going to school too?*

[...]

B: bane clasesuli, bane ibua?  
Tomorrow there's no school; what's tomorrow?

[...]

A: *igi be sogsa, bane clase sate?*  
*What did you say, there's no class tomorrow?*

B: clase sate bane.  
There's no class tomorrow.

A: *degite bur- igi ... mimmigan*  
*So – how ... the children*

B: **na=mal-o-suli**  
**go=PL-FUT-NEG**  
[They] won't go. (July 3, 2008, rec. 2, 7:08)

In this case, although there is no contrast marker, the context provides ample evidence for a

contrast pair between positive and negative. As in example (54), there is a sentence with a negative meaning appearing before the negative form in question. However, the context still appears to be contrastive.

In example (56), repeated from (47), the utterance has no conversational context since it was the first utterance of a short conversation:

- (56) gab=mal-oe o gab=**mal-o-suli**  
 sleep=PL-FUT or sleep=**PL-FUT-NEG**  
 ‘[Are you] going to sleep or not?’ (unrecorded conversation, Jan. 7, 2009)

In this example, a direct contrast is drawn between the negative and positive versions of the proposition. Furthermore, the direct juxtaposition of the two orderings shows how the NEG-final ordering preserves the ordering of the positive proposition, simply adding the negative at the end. This suggests that priming effects may contribute to the tendency to use the NEG-final order in contexts containing the positive ordering. There is no other negative sentence in the context, so this example strongly supports the hypothesis.

In example (57) the negative statement that land in Kungiler Nega (a group of homes being built adjacent to the municipality of Kuna Nega) will not be cleared is being contrasted with the positive statement that land in Kuna Nega will be cleared. The form has the order *mala-oe-suli* (PL-FUT-NEG).

- (57) A: suli, we Kuna Nega suli, we Kungilerneg  
 No, that’s not Kuna Nega, that’s Kungiler Nega.

B: *urgoneg sobnaidgi?*  
*Where they are building the wooden houses?*

A: eye, urgomarneg sobarbukwamala we Kungilernega.  
 Yes, where they’re building the wooden houses, that’s Kungiler Nega.

wedi aaga napa neg uilesmala. (*--aa!*)  
 That’s why they gave [us, Kungiler Nega people] that land.

Kuna Nega degsoggudi egi dogarnaisuli, Kuna Nega gwapa,  
 It’s not Kuna Nega, so [they] aren’t going in there, all the Kuna Nega people,

... Kuna Negadi campo eminaidi.  
 ... the people that clear the land around Kuna Nega.

nuedi anmarga soge  
 “Good,” they tell us,

be-mar-di campo emi-le=**mal-o-sur-dake**  
 2ND-PL-CONTR land clear-PASS=**PL-FUT-NEG-QUOT**  
 “As for you [people in Kungiler Nega], that land won’t be cleared.”

(Aug. 11 2010, rec. 5, 13:43)

Again, the NEG-final order occurs in a context where there is a marked contrast between positive and negative. Although the positive version of the negative appears inside a relative clause, it is still overtly present. The contrast marker *-di* appears on the pronoun *you*, which refers to the people of Kungiler Nega, who have no obligation to clear land, as opposed to the people of Kuna Nega, who do. This has the effect of contrasting the positive and negative versions of the statement.

In conclusion, all six of the examples involving NEG-final ordering appear in contexts containing a positive statement that is contradicted, supporting the hypothesis that this ordering appears in contrasts in which NEG is focused. However, it is important to note that four of the examples (53, 54, 55, and 57) also contain statements with a negative meaning preceding the negative form in question.

### 8.3 Adverbial-Final Orderings

The following examples have the adverbial-final affix orderings (ending with *-mala*, PL, *-moga*, ‘also,’ or *-bali*, ‘again, back’). If the inverse of the hypothesis is true, then the conversational context should lack a marked contrast between the negative sentence and a positive counterpart. There should be no overt statement of the positive version of the negative. If this is the case, the example in question will be seen as supporting the hypothesis. Of course, given this situation, it is expected that the context should be more likely to contain statements with a negative meaning, such that the negative form in question agrees with them.

In example (58), taken from the same conversation (and same speaker) as example (57), there is a contrast between the negative sentence (‘In Kungiler Nega, you won’t clean up the land’) and a positive counterpart in the preceding context (‘In Kuna Nega, they always clean up the land’). The contrastive marker *-di* is also used to distinguish the two locations, which correspond to the negative and positive propositions. The example contains three verb forms with the ordering *-oe-suli-mala* (FUT-NEG-PL).

(58) A: Kuna Negagindi campo emilieardaed.  
In Kuna Nega, they always clean up the land.

ee dake, gaganmar weararananai,  
See, [they] are gathering up the leaves,

emilergebe aa emilesurdibe multarguleged igi mani, geb ...  
[you] have to clean up the land; if [you] don’t, [you] get fined, how much money, and ...

B: *webadina?*  
*And over there?*

A: *webardina* anmarga soglesa, suliye,  
As for over there, they told us, “No,”

be-ga im-mar akar gu-o=sur-mar-ye  
2ND-DAT what-PL different become-FUT=NEG-PL-QUOT  
“things won’t go bad on you,



we-di campo emiog-**o=sur-mar**  
 3RD-CONTR land clear-FUT=NEG-PL  
 “there [you] won’t clean up the land,

be-di sik-leg-**o=sur-mar**  
 2ND-CONTR cut-PASS-FUT=NEG-PL  
 “you won’t cut [weeds],

be immar akar salegosuli.  
 “you won’t have any problems.”

(Aug. 11, 2010, rec. 5, 14:02)

One explanation for the unexpected ordering may be that because the statements in (58) are reiterating the negative statement made earlier in the conversation, shown in (57). Even though a positive statement is also present, the speaker is agreeing with a previous negative statement. Of course, the last two of the three negative verb forms directly follow other negative statements with similar meanings. These three forms must be considered exceptions to the hypothesis, but their exceptional nature is explained by the other negatives in the context.

Similarly, in example (59), the positive version of the negative statement is suggested in a question (‘will they forget?’), but the speaker does not opt for the NEG-final ordering (‘they will not forget’). Instead, he uses the *oe-suli-mala* (FUT-NEG-PL) ordering. The contrastive marker *-di* is also present in the context, but it is highlighting the speaker’s identity in a meta-statement that has little to do with the negative proposition. This is another counterexample to the inverse of the hypothesis.

(59) A: itogena. anmardi geg deggue. nabir, igi anmardi, iedgu anmar gaya. suli.  
 Listen. As for us, we can’t do that, really, how could we, how could we forget our language? No.

anmar mimmigan odurdaksuli. degi aa? be itogena.  
 We don’t teach the children. That’s it, right? Listen.

B: *degite, iegoe?*  
*Then, will [they] forget?*

A: **iegosuli** an dakdo. aadi ee escuelagi, emigi escuelagine maestramar odurdaksokarmoga.  
 [They] won’t forget, I see. As for that, in school, now the teachers are about to teach it in school too.

B: *mmm.*

A: aye. an-di an dak-oe bar ieg-**o=ur-mala** an dak=sun-do, dak-sa<sup>28</sup>  
 yes 1ST-CONTR 1ST see-FUT again forget-FUT=NEG-PL 1ST see=truly-well see-PFV  
 Yes. I see that [they] won’t forget it, I see, [you] see.

(Aug. 11, 2010, rec. 3, 4:14)

<sup>28</sup> This example also includes *bar*, but in this context, the word has the sense ‘again,’ as in ‘they won’t forget it again once they learn it.’ This sense of *bar* does not have a contrastive meaning, so it is not problematic for the inverse of the hypothesis.

The reason for this unexpected ordering could be that another negative verb (*iegosuli*, ‘they won’t forget’) directly precedes the negative form in question. As in example (58), the speaker may see the negative form as a continuation of the previous negative statement, and therefore not mark it as contrastive. The previous negative could also have the effect of priming its ordering; the second verb being identical to the first except for the addition of the final *-mala* (‘PL’).

Example (60) is consistent with the inverse of the hypothesis in that it does not contain any overt statement of the positive version of the negative sentence, ‘they won’t speak Kuna anymore.’ It also does not contain the contrastive marker *-di*, although the negative polarity item *bar*, ‘anymore,’ arguably indicates contrast.

- (60) *bar anmar dulegaya yoggudoe binna binna bar dulegayaba bar sunmaksurmala,*  
Our Kuna language will be lost, bit by bit, they don’t speak in Kuna anymore

*dake emisgwa bato gudidiimala aku itomalad.*

Look, now already there are [kids] running around that don’t understand.

*tegido ep– yoo–*

So, back then– in the fut–

*yooedse burguoedsunna bur buledo,*

in the future, it will really die, even more,

*bar sunmak-o=sur-mala dule-gaya*  
again talk-FUT=NEG-PL person-mouth  
[they] won’t speak Kuna anymore.

(Aug. 7, 2010, rec. 1, 1:31)

This does not technically contradict the inverse of the hypothesis, so it is considered as supporting the hypothesis.

Example (61) is an unelicited example that was captured during a break in elicitation sessions. In this example, a working mother scolds her children, saying ‘I won’t buy anything for you.’ This example fits the hypothesis in that there is no overt positive statement to be contrasted with the negative statement. Instead, the negative is part of an *if/then* construction, where the *if*-clause also has a negative meaning. The adverbial prefix is *-bali*, which can be interpreted here as ‘again’ (with respect to buying things) or ‘either’ (with respect to not going to work).

- (61) *Yanita, Yamar, aide! uaya bemar sater be it – itosa,*  
Yanita, Yamar, get down! If you don’t listen, [you] hear,

*bega an immar amba an arbanaosuli,*

I won’t go to work for you anymore,

*an be-ga ib-mar bak-o=sur-ba*  
1ST 2ND-DAT what-PL buy-FUT=NEG-again  
I won’t buy anything for you either.

(Aug. 20, 2010, rec. 1, 16:09)

This example is consistent with the inverse of the hypothesis, since there is no positive statement and no contrast markers.

Example (62) is another case of the adverbial-final ordering (*-oe-suli-mala*, FUT-NEG-PL), in which there is no overtly stated positive version of the negative statement. Again, the negative statement is part of a sequence with an *if/then* meaning, ‘you have to do a lot of paperwork or they won’t let you in.’ There is no contrastive marker *-di*. The example conforms to the inverse of the hypothesis.

(62) A: *doctorsse arbi?*  
*Did he go to the doctor?*

B: *yoo an nae. wegindi bule arbaed geb bin nanalege.*  
 I haven’t gone yet [with him]. Here [in the city] it’s a lot of work to go.

*hospitalse nadbardibe an oibogoe, daksa.*  
 If [I] go to the hospital I will stay up all night, see.

*papel immak-dag-oe abgayala be o-dog-o=sur-mala*  
*paper make-come-FUT at.first 2ND CAUS-enter-FUT=NEG-PL*  
 [You] will come to do a lot of paperwork first [or] [they] won’t let you in.

(Aug. 19, 2010, rec. 6, 10:06)

This example is taken as supporting the hypothesis.

In example (63), there are two verbs with adverbial-final orderings, (*o-sur-moga*, *o-sur-mala*). In the context of the first verb, there is no direct statement of a positive version of the negative sentence (‘My mom won’t stay here either.’). However, the sentence does follow the statement (‘what about here?’); which could be seen as invoking the positive version of the negative. The first verb is also in a quoted sentence containing the contrastive marker *-di*, which refers to the first-person speaker of the quote (‘my mother’). However, the morpheme is not marking a positive-negative contrast, since the marker is contrasting two different people who are both doing the same thing (not staying here). This verb must be taken as a counterexample.

In the second verb in this example, there are positive sentences (‘it’s up to you’) (‘if you want to stay’) in the context, but they are in agreement with the negative sentence (‘I won’t obligate you’). There is also a contrastive *-di* in the sentence, but it serves only to clarify the identity of the speaker. This can be considered consistent with the hypothesis.

(63) A: *annan anba namogoe anga,*  
 My mom will go with me too [she said] to me

*akarsuli beba namogoe.*  
 “No problem, I’ll go with you too.”

*geb despues San Blasse nader.*  
 “Then afterwards [I] might go to San Blas.”

*Variable Affix Ordering in Kuna*

mientras bemar an visitar sagwichi nabir samaloe.  
“In the meantime I’ll stand visiting you, we really will do [that].”

B: *bar wegi ... be ... wegindina ...*  
*Here anymore ... you ... what about here ...*

A: an-nan-di                    wegi yoggu-**o=sur-moga-d**    pudar    wegi yoggu=moga-d  
1ST-mother-CONTR here stay-FUT=NEG-also-RHET sick.of here stay=also-RHET  
My mom won’t stay here either. She doesn’t feel like staying here either.

[...]

anmarga soqe, bedi yoggubier, wegi be yoggumaloe.  
[She] told us, as for you, if you want to stay, you’ll stay here.

be-gi    sii=mar-ye    pero    an-di            be    obligar-sa-**o=sur-mala**<sup>29</sup>  
2ND-in    sit=PL-QUOT but    1st-CONTR    2ND    obligate-do-FUT=NEG-PL  
It’s up to you. But I won’t obligate you.

(Aug. 18, 2010, rec. 5, 31:29)

This example therefore has one verb out of two that is consistent with the hypothesis.

In example (64), another adverbial-final ordering (*o-sur-moga*), there is also no direct statement of a positive version of the negative statement (‘You won’t see them anymore’). Instead, the negative statement is a continuation of similar statements in the preceding context. The word *bar* appears in the negative sentence, but here it has the meaning ‘(not) again,’ rather than a contrastive meaning.

(64) ... garmakdiidamoga, daksa. degisoggu be igi nugde, igar nikasuli itolesundo.  
... always running around, see. So you, what’s it called, without direction, it is heard truly.

machergan deobmoga machergan arbaed baid amisdibe naed, dikasur;  
Men are like that too, if men find another job, they go, far away;

bar    be    dak-**o=sur-moga**  
again 2ND see-FUT=NEG-also  
you won’t see them anymore either;

bane be gudiid nabiedbarsundo.  
one day you’re here, then [you] want to leave again. (Aug. 17, 2010, rec. 3, 0:10)

This example therefore conforms to the hypothesis.

In example (65), there are two adverbial-final sentences, both with the same affix ordering (*-oe-suli-bali*, or FUT-NEG-AGAIN). These sentences are a special case, because affix *-bali* has a

<sup>29</sup> Here, the plural *-mala* refers to the object, rather than the subject. This is one of the reasons why it is considered an adverbial rather than an agreement affix.

few different senses depending on the context. In positive verb forms, it can mean either ‘back’ (as in a reversative) or ‘again.’ When combined with the negative, *-bali* can mean either ‘not back,’ ‘not again,’ or ‘not either,’ where *either* sometimes acts as an intensifier, as it does in colloquial English. The ‘not back’ meaning appears to correlate with the order -ADV-FUT-NEG (*-bali-oe-suli*), while the ‘not either’ meaning appears to correlate with the order -FUT-NEG-ADV (*-oe-suli-bali*). This makes sense in that the ‘either’ or intensifier meaning places the morpheme in question in word-final position, which is arguably a focus position. In any case, the order of morphemes in the two forms in (65) is probably determined by the semantics.

Similarly to example (64), the first of these sentences (‘You won’t go back to Panama’) is a continuation of a previous discourse which also has a negative meaning. Earlier in the discourse (not shown) there is a positive sentence that is contradicted (‘I want to study’), therefore this sentence is technically a counterexample.

The second sentence containing the same string of affixes actually seems like it would be a good candidate for the NEG-final ordering, because the speaker is relating how he directly contradicted his sister’s suggestion, a positive statement. In this way, it also appears to contradict the hypothesis.

- (65) andi an ega soge, suliyé, estudiadose bergus begad.  
I said to [my children], “No, about studying, it’s finished, yours.”

estudio bar saosunna mani sateye estudiarsaed.<sup>30</sup>  
“Studying [you] will [not] do again, truly. There’s no money for studying.”

Panama-se na-**o=sur-bali**  
Panama-to go-FUT=NEG-**again**  
“[We] won’t go to Panama [City] either.”

[...]

geb an bun soggali, suliyé, an be bendakoyé.  
Then my sister said, “No, I’ll help you.”

[...]

bat begad trabajo gwakwa sii Panamagi.  
“A job sits ready for you in Panama.”

an soge suliyé, an na-**o=sur-bali-yé**  
1ST say no-QUOT 1ST go-FUT=NEG-**again**-QUOT  
I said, “No, I won’t go either.” (Aug. 15, 2010, rec. 4, 4:35)

Although these two examples seem to contradict the hypothesis, their ordering may be explained by the special circumstances of the affix *-bali*. If *-bali* appeared in its other position, it might be interpreted as ‘back.’ However, in this case, it has the meaning ‘not either.’

Table 4 summarizes the data. If the hypothesis were followed perfectly, the first column

<sup>30</sup> Here, the negative polarity item *bar* appears without a negative morpheme, but its meaning is still negative.

would show 100% for positives and 0% for negatives; while the second column would show 0% for positives and 100% for negatives. Note that among the adverbial-final examples each verb form is counted separately, so that the number of examples is 12 rather than 8.

Context	NEG-final ordering	Adverbial-final ordering
Contradicting positive	100% (6/6)	50% (6/12)
Agreeing negative	50% (3/6) (4/6)	92% (11/12)
Contrast marker	(3/6)	(6/12)

Table 4: The effect of focus on affix ordering

The data on NEG-final verb forms supports the hypothesis that the NEG-final order arises when there is a focus on the contrast between negative and positive. The data on adverbial-final verb forms shows only weak support for the inverse of the hypothesis. However, among the adverbial-final sentences, all exceptional cases except for those in example (63) can be explained either by the fact that the negative form is preceded by a similar negative sentence (examples 58 and 59) or by the argument that the adverbial-final order is used for semantic reasons (example 65). The two forms in example (63) remain a problem for the hypothesis.

#### 8.4 Word-Final Focus and the Habitual

Finally, in order to explore further the idea the word-final position is some form of focus position, data is presented using a different affix, the habitual. These examples do not contain the future or the other adverbial affixes; they contain only the negative and the habitual. The ordering of the negative *-suli* and the habitual *-dae* is more straightforward than the three-affix combinations because the two morphemes can appear adjacently in either order. Unfortunately, these examples are rare in the text corpus because there is a competing construction with a similar meaning.<sup>31</sup> From the small amount of data available, it appears that the NEG-final order is used to emphasize the negative as opposed to a positive version of the sentence, just as in the three-morpheme orderings in the previous section.

Beginning with the habitual-final orderings, the context shows no particular emphasis on the contrast between negative and positive. In example (66), there is a positive statement ('I think women's beads are beautiful') earlier in the discourse. However, the verb form in question follows a negative statement ('They're messy, loose.'). There are no contrast morphemes in the sentence. Therefore, this example may possibly support the hypothesis.

- (66) yer an dakdae omegan win aa?  
 I think women's beads are beautiful, right?
- win nasis nuedsunnaidibe.  
 If the beads are strung really well.

<sup>31</sup> The competing construction is periphrastic, with the negative morpheme attached to the verb 'know':

an wis=sur e-bo sunmake  
 1ST know=NEG 3RD-COM speak  
 'I never speak to him.'

[...]

wegi as-- win nued we sunba sunba akala sinni sinnigwa.  
Here-- beads well, they're messy, loose.

an abe=**sur-dae**, isdar an dak=dae  
1<sup>st</sup> want=**NEG-HAB** badly 1<sup>ST</sup> see=**HAB**  
I don't tend to like that, I think they look bad. (Aug. 17, 2010, rec. 2, 27:35)

In example (67), there is no positive version of the negative statement ('half of them don't usually eat'); instead the negative statement functions as an explanation for the preceding sentences which state that a cafeteria is going to be built. This conforms very well to the hypothesis.

(67) geb irgwen sigsokarbalid ee, comedor infantil burwiga.  
They're about to sit another thing here, uh, a children's cafeteria, for the kids.

aa egislenai burwiganga mas gunmalad.  
That's what's being asked for, so that the kids eat.

abar mas gun=**sur-da-mala**  
half food eat=**NEG-HAB-PL**  
Half [of them] don't usually eat. (Aug. 8, 2010, rec. 1, 1:14)

In example (68), the NEG-final order is shown. Unfortunately, this is the only example of the NEG-final order with the habitual. In this situation, the speaker actually uses two different constructions with very similar meanings, ('I didn't use to drink'). The first time, he makes the statement using the negative and the imperfective, in a normal tone of voice. The second time, he makes the statement using the negative and the habitual with NEG-final ordering. There is no overt contrasting positive statement ('I drink now') or contrastive markers; however, it is safe to say that the negative aspect of the sentence was being emphasized, since it was spoken very strongly with dramatic hand motions.

(68) gebesaila an cerveza gob=suli-na<sup>32</sup>  
at.first 1<sup>ST</sup> beer drink=**NEG-IMPV**  
At first I didn't drink beer,

gob=**da-suli**  
drink=**HAB-NEG**  
I didn't use to drink at all. (unrecorded conversation, Aug. 20, 2010)

Of course, since stress always falls on the first syllable of *-suli* when it is the last morpheme in a word, emphasizing the word results in emphasizing *-suli*. When *-suli* is followed by an adverbial, stress may fall either on *-suli* or on the adverbial, and in any case, *-suli* appears in its short form.

<sup>32</sup> It is ungrammatical to use a NEG-final ordering with the imperfective; that is *\*-na-suli*.

## *Variable Affix Ordering in Kuna*

The small amount of data on the ordering of NEG and HAB suggests that the NEG-final order might have the interpretation of “never” while the HAB-final order might have the interpretation of “usually not.” This seems consistent with the trend of the NEG-final endings giving a more emphatically negative meaning. It also seems consistent with the predictions of the semantic scope hypothesis as proposed by researchers such as Rice (2000). More data is necessary in order to determine whether this is true.

There are various reasons why it makes sense that the NEG-final order should be used to mark focus. First, when the negative morpheme occurs at the end of a verb word, it is always stressed. Second, the word-final position makes the negative morpheme more perceptually salient. Third, the NEG-final order may be primed by a preceding positive, which has the same ordering except that it lacks the negative morpheme at the end. It is unclear which of these explanations, if any, may be affecting affix order. However, the negative-focus hypothesis is satisfying because it suggests that there is a reason why speakers have a choice of orders.

### **References**

- Bresnan, Joan, Shipra Dingare, and Christopher D. Manning. 2001. Soft Constraints Mirror Hard Constraints: Voice and Person in English and Lummi. In *Proceedings of the LFG 01 Conference*, edited by Miriam Butt and Tracy Holloway King, 13-32. Stanford University: CSLI Publications.
- Coetzee, Andries W. 2008. Grammaticality and Ungrammaticality in Phonology. *Language* 84(2):218-257 .
- Erice, Jesus. 1980. *Gramática de la lengua kuna*. Panamá: Instituto Nacional de Cultura.
- Fabb, Nigel. 1998. English Suffixation is Constrained only by Selectional Restrictions. *Natural Language and Linguistic Theory* 6:527-539.
- Hammond, Michael. 1992. Morphemic Circumscription. In *Yearbook of Morphology 1991*, edited by Geert E. Booij and Jaap van Marle, 195-210. New York: Springer-Verlag.
- Hay, Jennifer and R. Harald Baayen. 2002. Parsing and Productivity. In *Yearbook of Morphology 2001*, edited by Geert E. Booij and Jaap van Marle, 203-255. Dordrecht: Kluwer Academic Publishers.
- Hay, Jennifer and Ingo Plag. 2004. What Constrains Possible Suffix Combinations? On the Interaction of Grammatical and Processing Restrictions in Derivational Morphology. *Natural Language and Linguistic Theory* 22:565-596.
- Hyman, Larry M. 2003. Suffix Ordering in Bantu: A Morphocentric Approach. In *Yearbook of Morphology 2002*, edited by Geert Booij and Jaap van Marle, 245-282. New York: Springer.
- Kari, James M. 1989. Affix Positions and Zones in the Athapaskan Verb Complex: Ahtna and Navajo. *International Journal of American Linguistics* 55:242-54.
- Kiparsky, Paul. 1982. From Cyclic to Lexical Phonology. In *Harry The Structure of Phonological Representations, Part 1*, edited by van der Hulst and Norval Smith, 131-175. Dordrecht: Foris.



- Krifka, Manfred. 2007. Basic Notions of Information Structure. In *Interdisciplinary Studies of Information Structure 6: The Notions of Information Structure*, edited by C. Fery, G. Fanselow, and M. Krifka, 13-55. Potsdam: Universitätsverlag Potsdam.
- Kungiler, Iguaniginape, ed. 1997. *Yar Burba, Anmar Burba: Espiritu de la Tierra, Nuestro Espiritu*. Panama: Congreso General de la Cultura Kuna.
- Muysken, Pieter. 1981. Quechua Word Structure. In *Binding and Filtering*, edited by F. Heny, 279-327. Cambridge, MA: MIT Press.
- Puig, Manuel Maria. 1946. *Gramática de la Lengua Caribe Cuna*. Panama: Editorial La Estrella.
- Rice, Keren. 2000. *Morpheme Order and Semantic Scope: Word Formation in the Athapaskan Verb*. Cambridge: Cambridge University Press.
- Ryan, Kevin. 2008. Morphotactics: Affix Order Variation and Learnability in Tagalog and Other Languages. Ms, UCLA.
- Sherzer, Joel. 1989. The Kuna Verb: A Study in the Interplay of Grammar, Discourse, and Style. In *General and Amerindian Ethnolinguistics: In Remembrance of Stanley Newman*, edited by Mary Ritchie Key and Henry Hoenigswald, 261-272. Berlin: Mouton.
- Sherzer, Joel. 1998. *Verbal Art in San Blas*. Albuquerque: University of New Mexico Press.
- Sherzer, Joel. 2003. Sketch of the Kuna Language. Available online through the Archive of Indigenous Languages of Latin America, <<http://www.ailla.utexas.org>>
- Sherzer, Joel. 2004. *Stories, Myths, Chants, and Songs of the Kuna Indians*. Austin, TX: University of Texas Press.
- Smith, Wikaliler Daniel. 2009. Plural Marking in the Kuna Pronominal System. In *Proceedings of the Conference on Indigenous Languages of Latin America (CILLA) IV*. Available online at [http://www.ailla.utexas.org/site/cilla4\\_toc.html](http://www.ailla.utexas.org/site/cilla4_toc.html).
- Zwicky, Arnold M. and Geoffrey K. Pullum. 1983. Cliticization vs. Inflection: English N'T. *Language* 59(3):502-513.

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**REPORT 15**

**SURVEY OF CALIFORNIA AND  
OTHER INDIAN LANGUAGES**

*Structure and Contact in  
Languages of the Americas*

**John Sylak-Glassman and Justin Spence, Editors**

**Andrew Garrett and Leanne Hinton, Series Editors**

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