Anchoring and Reduplicative Identity: Cases from Nancowry and Koasati

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1. Introduction

This paper problematizes the concept of Anchoring as defined in both Containment Theory (Prince and Smolensky 1993, McCarthy and Prince 1993) and Correspondence Theory (McCarthy and Prince 1995, McCarthy 1995). Specifically, McCarthy and Prince (henceforth M&P) state that Anchoring " should subsume Generalized Alignment" (1995:123). That is, Anchoring should stipulate both the matching between the edges of a reduplicant and its base as well as the positioning of a reduplicant with respect to its base. This suggests that there is a direct correlation between reduplicative identity and Generalized Alignment with respect to Anchoring. In particular, M&P claim that all suffixal reduplicants match the right edges of the related bases, and all prefixal reduplicants match the left edges of the related bases. However, evidence from two unrelated languages, Nancowry (a Nicobarese language; Radhakrishnan 1981), and Koasati (a Muskogean language; Kimball 1991), does not support this correlation.

In Nancowry, the right edge of the reduplicant matches the right edge of the base (in bold) and is prefixal, as shown in (1) below.

(1) Nancowry:

BASE:	-ya***k***	'to conceive'
R+B:	?u***k*** - ya***k***	'to conceive'

In contrast, the beginning of the Koasati reduplicant matches the beginning of the base and is suffixal, as shown in (2) below.

(2) Koasati:

BASE:	***t***ahas-	'to be light in weight'
B+R:	***t***ahas - ***t***o:	'to be light many times'

Since the generalization which Anchoring captures does not hold for these two patterns, we argue that Generalized Alignment is separate from Anchoring. We also show that we can account for Semai prefixal reduplication where both the right and left edges are copied. Thus, we show that Anchoring (a la McCarthy & Prince 1993, 1995) cannot deal with these cases. Both Alignment constraints in conjunction with a modified Anchoring constraint are necessary to account for the cases shown above.

The first section of this paper presents reduplication data from Nancowry, spelling out the patterns shown in (1). The second section introduces the relevant constraints, defines these constraints for Nancowry and gives our analysis of the Nancowry data. The third section presents reduplication data from Koasati, spelling out the patterns shown in (2). The fourth section uses similar constraints introduced in section 2, redefining them for Koasati, and gives our analysis of the Koasati data. The fifth section shows how Anchoring alone fails to account for these patterns. In addition, we further support our point by extending our analysis to a case of reduplication from Semai (a Mon-Khmeric language; Diffloth 1976). The last section summarizes our findings.

2. Nancowry Reduplication

This section illustrates and discusses the patterns that appear in Nancowry reduplication. This reduplication is semantically vacuous. We present general observations regarding the overall reduplicative form itself, but we are focussing primarily on the identity and positioning of the reduplicant in relation to the base form (for discussion of the overall form see Meek 1995, Alderete et. al. 1996).

As noted above, Nancowry contains forms in which the last segment of the prefixal reduplicant matches the last segment of the base. The matching segments are bolded and underlined in (3).

(3) Nancowry Data

a. ?u**k** - ya**k**	'to conceive'
b. ?i**t** - ca**t**	'to jump'
c. ?u**m** - ci**m**	'to mourn'
d. ?u**k**-po**k**	'to tether an animal'
e. ?u**p**-?e**p**	'to plan'
f. ?u**p**-lo**p**	'to cover one's self'
g. ?u**m**-lo**m**	'to fold'
h. ?i**t**-?e**t**	'to write'
i. ?i**t**-to**t**	'to lend'
j. ?i**n**-ti**n**	'to push'

A number of patterns can be observed here. The first three observations pertain to general facts about the reduplicant which are not integral to our point. First, the reduplicant always begins with a glottal, [?]. Second, the vowel of the reduplicant is always a high vowel. Third, the vowel of the reduplicant alternates between [i] and [u] depending on the place feature of the final consonant (Meek 1995). The diagram in (4) illustrates these observations.

(4) Diagram:

Base	Red +Base
yak	? u k - yak
	dorsal dorsal
	* yak - yak
	* yuk - yak
	* yik - yak
	* ?ik - yak

This diagram reemphasizes that the only matching segments between the base and the reduplicant are the last segments in each form. Vowels may or may not match as in (3i,j).

The final two observations that can be gleaned from this data that are integral to our focus are the following. First, the reduplicant attaches to the left edge of the base, as illustrated in (5).

(5) Positioning of Nancowry reduplicant

$C_1V_1C_2$ => $?I\underline{C_2}$ - $C_1V_1\underline{C_2}$ * $C_1V_1\underline{C_2}$ - $?I\underline{C_2}$

R   **B**   **B**   **R**

Second, the coda of the reduplicant matches the coda of the base, as illustrated in (6).

(6) Identity of Nancowry reduplicant: last segment

$C_1V_1C_2$ => $?I\underline{C_2}$ - $C_1V_1\underline{C_2}$

↑   ↑

In sum, the relevant observations, illustrated in (5) and (6) above, are summarized below in (7).

(7) Relevant observations: Nancowry

a. The reduplicant is attached to the left of the base.

b. The coda of the reduplicant matches the coda of the base.

These two observations motivate the constraints defined in the next section.

3. Analysis of Nancowry Data

In this section, we analyze the Nancowry data within an Optimality Theoretic framework. We use a Generalized Alignment constraint and an Anchoring constraint, defined according to the observations made in section 1. We show that both Alignment and Anchoring are satisfied in optimal forms.

The first constraint that we consider positions the reduplicant at the beginning of the base. This constraint is formulated under Generalized Alignment (cf. McCarthy & Prince 1994) and is defined in (9).

(9) ALIGN-L
ALIGN(RED, R, Base, L)
The right edge of a reduplicant is aligned with the left edge of its base.

This is motivated by the observation stated in (7a). The constraint itself is schematically represented below in (10).

(10) Input: /yak/

	Candidates	ALIGN-L
☞ a.	$?uk_R][_Byak$	
b.	$yak_B][_R?uk$	*!

This shows that the winning candidate for Nancowry must look like the example in (10a) and not (10b).

The second constraint matches the coda of the reduplicant with the coda of the base. The constraint that has been designed to capture this relationship is R/L-ANCHOR (cf. McCarthy & Prince 1995). This is defined in (11).

(11) R-ANCHOR
Any element at the right edge of the base has a correspondent at the right edge of the reduplicant.

This is motivated by the observation in (7b). The constraint itself is schematically represented below in (12).

(12) Input: /yak/

	Candidates	R-ANCHOR
☞ a.	$?uk_2]_R$, $y_1ak_2]_B$	
b.	$_R[y_1u?$, $_B[y_1ak_2$	*!

(Subscripts denote corresponding segments; positioning of affixes is not illustrated.)

This shows that the winning candidate for Nancowry must look like the example in (12a) and not (12b).

The final step is to show how these constraints choose the correct candidate for Nancowry. Below we focus only on candidates which are relevant to the above constraints.

(13) Nancowry: ?ukyak 'to conceive'
Input: /yak/

	Candidates	ALIGN-L	R-ANCHOR
☞ a.	$?uk_R][_Byak$		
b.	$yak_B][_R?uk$	*!	
c.	$yu?_R][_Byak$		*!
d.	$yak_B][_Ryu?$	*!	*

In the above tableau, candidates (b) and (d) violate ALIGN-L because the reduplicant is attached to the right of the base. Candidates (c) and (d) violate R-ANCHOR because the right-edge segments are not identical. Thus, candidate (a) is the winner because it doesn't violate any of the constraints. Because of this, we have no motivation for ranking the constraints with respect to each other.

4. Koasati Reduplication

This section illustrates and discusses the patterns that appear in Koasati reduplication. This pattern of reduplication, known as punctual reduplication (Kimball 1991), is used to indicate plurality of the subject in stative verbs and to indicate repetition of the action in active verbs. We again present general observations regarding the overall reduplicative form itself, continuing to focus primarily on the identity and positioning of the reduplicant in relation to the base form.

As noted in the introduction, Koasati contains forms in which the first segment of the suffixal reduplicant matches the first segment of the base. The matching segments are bolded and underlined in (14). The suffixes, *-pin*, *-kin*, and *-nan* indicate a citation form and denote classes of verbs.

(14) Koasati Data

a.	**t**ahas - **t**o: - pin	'to be light in weight many times'
b.	**l**apat - **l**o: - kin	'to be narrow many times'
c.	**c**ofok - **c**o: - nan	'to be angled many times'
d.	**c**opok-**c**o:-sin	'to be a hill many times'
e.	**l**imih-**l**o:-kin	'to be smooth many times'
f.	**p**oloh-**p**o:-kin	'to be circular many times'
g.	**t**alas-**t**o:-ban	'to be thin many times'
h.	**t**onoh-**t**o:-kin	'to be round many times'

A number of patterns can be observed here. First, the vowel of the reduplicant is always [o:]. Second, the reduplicant attaches to the right edge of the base. Third, the onset of the reduplicant matches the onset of the base. These last two observations motivate the constraints below.

5. Analysis of Koasati Reduplication

In this section, we analyze the Koasati data within an Optimality Theoretic framework. Again we use a Generalized Alignment constraint and an Anchoring constraint, defined according to the observations made in section 3. As before, we do not motivate a particular ranking with respect to the relevant constraints because they must both be satisfied.

The first constraint to consider places the reduplicant to the right of the base. Again, this constraint is formulated according to Generalized Alignment (cf. McCarthy & Prince 1993) and is defined below.

(15) ALIGN-R
Align(RED, L, Base, R)
The left edge of a reduplicant is aligned with the right edge of the base.

This constraint is schematized below in (16).

(16) Input: /tahas/

	Candidates	ALIGN-R
☞ a.	$tahas_B][_R to:$	
b.	$to:_R][_B tahas$	*!

This shows that the winning candidate for Koasati must look like the example in (16a) and not (16b).

The second constraint matches the onset of the reduplicant with the onset of the base. Again, an ANCHORing constraint is used(cf. M&P 1995), as defined below in (17).

(17) L-ANCHOR
Any element at the left edge of the base has a correspondent at the left edge of the reduplicant.

This is schematically represented in (18).

(18) Input: /tahas/

	Candidates	L-ANCHOR
☞ a.	$_R[t_1o:, {}_B[t_1ahas_2$	
b.	$_R[o:s_2, {}_B[t_1ahas_2$	*!

This shows that the winning candidate for Koasati must look like the form in (18a) and not (18b).

As in section 2, the final step is to show how these constraints choose the correct candidate for Koasati. Note that the final suffixes are not included in the following candidates because they are not relevant to the case at hand.

(19) Koasati: tahasto:pin 'to be light in weight many times'
Input: /tahas/

	Candidates	ALIGN-R	L-ANCHOR
☞ a.	$tahas_B][_R to:$		
b.	$to:_R][_B tahas$	*!	
c.	$tahas_B][_R o:s$		*!
d.	$so:_R][_B tahas$	*!	*

Candidates (b) and (d) violate ALIGN-R because the reduplicant is attached to the left of the base. Candidates (c) and (d) violate L-ANCHOR because the left-edge segments are not identical. Thus, candidate (a) is the winner because it doesn't violate any of the constraints. As in section 2, we have no motivation for ranking the constraints with respect to each other.

6. Anchoring and Alignment

This next section addresses the question of whether or not we need both anchoring and alignment. As noted in the introduction, McCarthy and Prince (1995: 123) argue against the need for both, stating that "it is clear that ANCHORing should subsume Generalized Alignment; as formulated, it captures the effects of Align(MCat, E1, PCat, E2), for E1 = E2 in McCarthy and Prince (1994)." M&P provide two different, but related, definitions for capturing the base/reduplicant edge relationship. We begin with these two definition and show that they cannot account for the above data.

The first definition from which they were working is given below in (20).

(20) ANCHORING (M&P, 1993: 63)
In R + B, the initial element in R is identical to the initial element in B.
In B + R, the final element in R is identical to the final element in B.

This stipulates that the edge of the base where the affix is attached is necessarily the same edge that has the copied segment. For example, this would mean that if a reduplicant attaches to the right edge (i.e., prefix), then the matching segments between the base and reduplicant must also be at that same right edge. However, we have seen that this is not always true (Nancowry reduplication). There is greater variability in base/reduplicant relations than this definition allows.

The second definition captures the alignment effects within a Correspondence framework. We provide the following definitions of Anchoring, based on M&P (1995):

(21) ANCHOR-L
Any element at the left edge of the base has a correspondent at the left edge of the reduplicant.

(22) ANCHOR-R
Any element at the right edge of the base has a correspondent at the right edge of the reduplicant.

In (21) and (22), the definitions given do not overtly spell out the edge relationship between the placement of the reduplicant and the edge-matched segments as in (20) above. However, given the quote in the introduction to this section, it is clear that M&P are assuming this relationship. Therefore, in order to satisfy ANCHOR-L/R, the reduplicant must not only match the base at the L/R edge, but must be attached there as well.

To illustrate the ineffectualness of these definitions with respect to our data, consider the tableaux (23) and (24) which evaluate the same candidates as in (13) and (19) above. Note that we do not include ALIGN-{R, L} in these tableaux because according to M&P (1995:123), ANCHOR-L and ANCHOR-R alone should be able to choose the correct optimal forms based on their respective rankings. We are using ❽ to represent a candidate that is chosen as optimal but is not the correct surface form; the true optimal form is still marked with ☞.

(23) Nancowry
Input: /yak/

	Candidates	ANCHOR-R	ANCHOR-L
☞ a.	?uk$_{R}$][$_{B}$yak		*!
❽ b.	yak$_{B}$][$_{R}$?uk		
❽ c.	x yu?$_{R}$][$_{B}$yak		
d.	yak$_{B}$][$_{R}$yu?	*!	

In tableau (23), candidate (d) is eliminated because it violates ANCHOR-R, i.e., the reduplicant is attached to the wrong (non-corresponding) edge of the base. Candidate (a) (the actual surface form) is eliminated because it violates ANCHOR-L, i.e., the reduplicant is copying the wrong edge of the base in relation to where it's attaching to the base. Candidates (b) and (c) do not violate either constraint, tying as the optimal candidates. For this case, M&P's Anchoring constraints do not work, choosing anything but the correct candidate.

The same holds true for Koasati, as shown in (24).

(24) Koasati
Input: /tahas/

	Candidates	ANCHOR-L	ANCHOR-R
☞ a.	tahas$_{B}$][$_{R}$to:		*!
❽ b.	to:$_{R}$][$_{B}$tahas		
❽ c.	tahas$_{B}$][$_{R}$o:s		
d.	o:s$_{R}$][$_{B}$tahas	*!	

In (24), we get the same result as in (23). Candidate (a) and (d) are eliminated because the reduplicant is attaching to the wrong edge in relation to the base/reduplicant edges where the segments correspond. Candidates (b) and (c) are the chosen, tied forms, but neither one is the actual surface form (candidate (a)). Thus, these definitions of Anchoring (21, 22) choose the incorrect forms as optimal.

In order to get the right candidate as optimal, it would be necessary to posit a higher ranked constraint, such as RED=PFX ('The reduplicant is a prefix'). However, this would be a stipulation, analogous to the one found in M&P's original definition of Anchoring. On the other hand, Generalized Alignment has been used to position affixes in general (see M&P 1994). Since reduplication is a form of affixation, we conclude that it is more consistent and economical to use Alignment in these cases, rather than stipulating a reduplicative-specific constraint. Thus, this means that Alignment must be conceptualized and implemented separately from Anchoring.

Finally, we provide further evidence for the separation of Alignment from Anchoring by testing our analysis with a language that has base/reduplicant correspondence between both edges, yet attaches to only one edge. This case arises in Semai, a Mon-Khmeric language (Diffloth, 1976). In Semai reduplication, both the coda and the onset of the reduplicant match the coda and the onset of the base, as in (25).

(25)	dŋɔh	**dh-dŋɔh**	'appearance of nodding constantly'
	cʔɛ:t	**ct-cʔɛ:t**	'sweet'
	cfa:l	**cl-cfa:l**	'appearance of flickering red object'
	bʔəl	**bl-bʔəl**	'painful embarrassment'
	ghʉ:p	**gp-ghʉ:p**	'irritation on skin (e.g. from bamboo hair)'
	taʔəh	**th-taʔəh**	'appearance of large stomach constantly bulging out'

Note that this also shows that the reduplicant is prefixal. To account for this pattern, we use an analysis parallel to those given above for Nancowry and Koasati. The relevant constraints are the following: ALIGN-L for a prefixal reduplicant, L-ANCHOR for corresponding left edges and R-ANCHOR for corresponding right edges. This is shown below in (26).

(26) L-ANCHOR, R-ANCHOR

Input: / c?ɛ:t/

	Candidates	ALIGN-L	L-ANCHOR	R-ANCHOR
☞ a.	ct$_R$][$_B$c?ɛ:t			
b.	c?ɛ:t$_B$][$_R$ct	*!		
c.	c?$_R$][$_B$c?ɛt			*!
d.	?t$_R$][$_B$c?ɛt		*!	

In the above tableau, candidate (b) violates ALIGN-L because the reduplicant is attached to the right of the base. Candidate (c) violates R-ANCHOR because the right-edge segments are not identical. Candidate (d) violates L-ANCHOR because the left-edge segments are not identical. Thus, candidate (a) is the winner because it satisfies all of the given constraints. Note again that we have no motivation for ranking the constraints with respect to each other[1].

7. Conclusion

In this paper, we have shown that conceptions of Anchoring that subsume Generalized Alignment (21-22) cannot choose the correct forms for Nancowry, Koasati, and Semai reduplication. By keeping Alignment and ANCHORing as mutually distinct constraints, we achieve the following. First, both reduplicant placement and segment matching in Nancowry and Koasati reduplication are straightforwardly accounted for by our analysis. Second, it is not necessary to create 'exceptional' constraints, i.e., RED=PFX, to incorporate the phenomena shown above. Third, this analysis can be extended to other types of reduplication, such as Semai. In sum, we can account for reduplication patterns that previous analyses ignored/overlooked.

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[1] The reduplicants in (31c & d) include a glottal in order to maintain a two-segment reduplicant, consistent with the rest of the candidate set.

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