

Lak Reduplication: Neither Morphological Nor Phonological Fixed Segmentism*

Introduction

Lak is a Northeast Caucasian language spoken by over 150,000 people in the central highlands of the Republic of Dagestan in the Russian Federation. It utilizes reduplication in certain durative verb forms, notably imperatives, the present participle (both short and full forms), the present gerund, and the assertive present and conditional forms (Murkelinskij 1971:187; Khajdakov 1962:410-416). This reduplication can be described as in Friedman (1989), “[I]n progressive verbs, certain affixes, which all have a linking vowel /i/, trigger reduplication of the root consonant nearest to the inflectional affix [...]”. This paper argues that the surface value of the “linking vowel” following the reduplicant as /i/ cannot adequately be accounted for by phonological or morphological fixed segmentism as described in Alderete *et al.* (1999) and therefore offers a challenge to that theory.

Section 1 presents examples of reduplication in Lak along with a complete morphological parse of each form presented. After this discussion of the data, the second section argues for the benefits of an Optimality Theoretic analysis, which serve as the motivation for this work. The third section introduces the markedness constraints that influence the shape and placement of the reduplicant. Then, The fourth section goes on to explain the constraints that motivate the analysis of /i/ as a fixed segment whose quality is shaped by TETU. Next, the fifth section compiles these findings by providing constraint rankings with tableaux and explaining the reasoning behind them. Finally, the sixth and seventh sections will discuss the relevance of the theory of fixed segmentism (Alderete *et al.* 1999) to this analysis.

*Acknowledgements: This work has benefitted greatly from criticism by Victor Friedman, Jason Riggle, and two anonymous reviewers for *Chicago Working Papers in Linguistics*. I wish to thank Victor Friedman and Alan Yu for providing the inspiration and motivation to examine this data.

1 Data

The reduplicant takes the verbal stem, which is usually word-initial, as its base (Friedman 1989). The verbal stem is usually a single syllable, which may be closed or open. Reduplication targets the coda of closed syllables. If the syllable is open, it targets the initial consonant of the syllable.

(1) Present Gerund

- a. čič -la -č -i -ni
write -DUR ~REDUPLICANT -LINKING/i/ -when
“When writing” (čič- ‘write’; Murkelinskij 1971:230)
- b. las -la -s -i -kun
take -DUR ~RED -LINKING/i/ -after
“After taking” (las- ‘take’; Khajdakov 1962:412)

The durative aspectual form of the verb is generally derived from the unmarked aspect¹ using the infix *-la-*. Some verbal roots, however, are suppletive and show no specific durative marking. They are durative and do not change form to fit any other aspect (El’darova 1999). Some examples of this suppletion are: *zu-* ‘to work,’ *huzu-* ‘to swim,’ and *na-* ‘to go’ (Khajdakov 1966). The durative aspect expresses “a continuing or regularly repeating action” (Murkelinskij 1971). Scholars disagree as to whether /a/ should be considered part of the durative marker or of another morpheme. Khajdakov (1966) and Murkelinskij (1971) list the durative marker simply as *-l-*, but El’darova (1999) lists it as *-la-*. This work will follow El’darova (1999) in analyzing the durative marker as *-la-* since this is by far its most common form.

The reduplicant can be analyzed as an affix that is suffixed either onto the durative marker, if the durative aspectual form is derived, or onto the verbal root, if the durative aspectual form is characterized by suppletion (as in, for example, *zu-* to work,’ cf. (2b) below).

The ‘when’ morpheme is one of four morphemes denoting ‘where,’ ‘when,’ ‘after,’ and ‘since’ which can be placed after the reduplicant and LINKING /i/ in durative present gerundial forms (Khajdakov 1962:412).

A fixed /i/ vowel acts as a *linking* agent between the suffix that follows it and the preceding reduplicant (Friedman 1989). This will be a main subject of analysis in ??.

In addition to the present gerund forms in (1), the present participial forms in (2) also exhibit reduplication. Note especially the way in which reduplication occurs when the stem is suppletive, as in (2b).

¹The unmarked aspect was most recently termed the “perfective” by El’darova (1999). The terminology used in describing Lak verbal forms varies widely and is applied inconsistently, cf. Friedman (1989).

(2) Present Participle

- a. ħač' -la -č' -i -ssa
drink -DUR ~RED -LINKING/i/ -PARTICIPLE:NONREFERENTIAL

“Drinking” (ħač- ‘drink’; Khajdakov 1962:410)²

- b. zu -z -i -ssa
work:DUR ~RED -LINKING/i/ -PTCP:NREF

“Working” (zu- ‘work,’ *Dur*; Murkelinskij 1971:219)

- c. las -la -s -i -ssa
take -DUR ~RED -LINKING/i/ -PTCP:NREF

“Taking” (las- ‘take’; Khajdakov 1962:412)

The participial suffix *-ssa* is non-referential and gives the participle an adjectival meaning (Murkelinskij 1971:418-419). This form is also used to render general, non-referential adjectives from stems, as in the word *qinssa* (Khajdakov 1962:284), which has the root *qin* ‘good’ with the *-ssa* suffix. Referential markers such as *-ma*, *-mur*, and *-mi* indicate that the adjective applies to a specific entity, and they are usually translated with a deictic such as ‘that’ (Murkelinskij 1971:219).

Assertive forms also exhibit reduplication. Assertive evidential marking implies that the speaker has reason to believe what he is claiming. This sense can be translated in a variety of ways and has been rendered here with ‘definitely.’ Lak also exhibits person marking in some forms, and the conditional mood is best translated with ‘if’ (Murkelinskij 1971).

(3) Assertive Forms

- a. buc -la -c -i -ssa -r
bring -DUR ~RED -LINKING/i/ -PTCP:NREF 3SG:PL:PRESENT

“He/she/it/they is/are definitely bringing” (buc- ‘bring’; Khajdakov 1962:411)

- b. i. ħač' -la -č' -i -ssa -nija
drink -DUR ~RED -LINKING/i/ -PTCP:NREF -CONDITIONAL

“If (he is) definitely drinking” (ħač- ‘drink’; 410)

- ii. las -la -s -i -ssa -nija
take -DUR ~RED -LINKING/i/ -PTCP:NREF -COND

“If (he is) definitely taking” (las- ‘take’; 412)

²*Transcription:* The apostrophe /' / indicates an ejective consonant. /ħ/ is a pharyngeal fricative similar to the Arabic 'ayn. The letter 'c' represents the voiceless affricate /ts/.

2 Constraints Shaping the Reduplicant

2.1 General Schema and Faithfulness Constraints

While rule-based, especially templatic, analyses specify the shape of the reduplicant, as in Marantz (1982), in an OT analysis, the shape of the reduplicant emerges from independently motivated markedness and faithfulness constraints. Markedness constraints penalize a certain piece of linguistic structure (or even all linguistic structure, as with *STRUC) while faithfulness constraints penalize specific relationships between an input form and candidate form.

Because in Lak reduplication the entire base, the verbal root, is never faithfully copied, FAITH-BR, which penalizes any instance in which a piece of linguistic structure is not identical in the reduplicant and its base, must be violated to give rise to attested forms. Consequently, FAITH-BR has a very low ranking. Next, the fact that Lak surface phonology is richer in structural variety than the markedness constraints to be proposed would allow shows that faith between input and output (candidate) forms (IO faithfulness, formulated as the constraint FAITH-IO) is ranked higher than markedness constraints. With these observations set forth, the analysis follows the general schema for TETU originally outlined by McCarthy and Prince (1995) and elaborated by Alderete *et al.* (1999:330).

- (4) General Ranking Schema for Reduplicative TETU
FAITH-IO » MARKEDNESS » FAITH-BR

FAITH-IO causes specified underlying phonological forms to surface. However, reduplicants have no specified underlying phonological form other than the base being copied in the surface string. Thus, by ranking markedness constraints over the constraint FAITH-BR, which regulates the degree of similarity between a reduplicant and its base, unmarked variants appear in the surface string at the expense of not copying part of the base.

An additional morphophonological faithfulness constraint must be ranked together with FAITH-IO.

- (5) REALIZE- μ
Assign one violation for each instance in which an underlying morpheme does not receive phonological exponence in a candidate form (Yu 2005).

This constraint prevents the reduplicant and the linking vowel from being deleted to satisfy markedness constraints. It also ensures that right anchoring, as in (8), does not simply copy the null coda of verbal roots composed of open syllables.

2.2 Markedness Constraints

The markedness constraints and their roles in shaping the reduplicant are as follows.

(6) *STRUC- σ

Assign one violation for each instance of linguistic structure; here, “linguistic structure” is defined as a phoneme (Yu 2005; Yu 2007, priv. comm.).

*STRUC- σ militates against having any syllables in the output. This limits the reduplicant to a form that does not produce an extra syllable, which forces the reduplicant to be a single consonant or vowel and not an exact copy of the entire syllabic verb root.³

(7) *VV

Assign one violation for each instance in which two vowels are adjacent to each other in a candidate form.

This constraint reflects the fact that the verb root’s vowel is never reduplicated. The equal ranking of *VV and *STRUC- σ causes the reduplicant to be limited to a single consonant, since additional consonants are penalized by *STRUC- σ . However, in closed syllables, which have two possible consonants to reduplication, the consonant that is reduplicated is determined by the following constraint.

(8) R-ANCHOR-BR

Assign one violation for each instance in which the right edge of the reduplicant does not correspond to the right edge of the base (McCarthy and Prince 1995; Kager 1999).

R-ANCHOR-BR ensures that the rightmost consonant of the base is used as the consonant that composes the reduplicant. The ranking of this constraint below *VV and *STRUC- σ is crucial because it allows the reduplicant to manifest in the form of the onset consonant of verbal roots when that root is an open syllable (as is often the case with suppletive roots that mark the durative aspect, such as *zu-* ‘to work’). If this constraint were ranked higher than it is, copying of the onset consonant in verbal roots composed of an open syllable would be prohibited, and this would be inconsistent with attested verbal forms.

Six constraints, FAITH-IO, REALIZE- μ , three markedness constraints, and FAITH-BR, interact to produce acceptable Lak reduplicants and to eliminate incorrect possibilities. Moreover, these constraints may capture general principles that operate elsewhere in Lak, which would mean that reduplication is simply a specific instance of principles that operate within the language as a whole.

3 LINKING V as an Example of TETU

LINKING V always intrudes between the reduplicant and the suffix that “triggers” reduplication in non-OT analyses (cf. Friedman 1989). While its shape is unimportant to its function as a linking element, LINKING V never surfaces as any vowel

³In Lak, syllables may be open or closed, may contain a long or short vowel, and may contain a diphthong ending in the glide /w/ or /j/.

other than /i/. This fact can be analyzed as a case of *the emergence of the unmarked* (TETU) as described by Alderete *et al.* (1999). In their definition, TETU is when a “normally inactive markedness constraint [which will be called] M reveals itself in BR [base-reduplicant] mappings where IO faithfulness is not relevant” (330). IO faithfulness does in fact seem to be irrelevant in the case of Lak reduplication because only the presence, not the shape, of LINKING V is specified in the input.

LINKING V is not an instance of morphological fixed segmentism because the /i/ that is the surface manifestation of LINKING V cannot be replaced with some other vowel segment in the same environment to produce a contrastive meaning; that action only produces ungrammaticality. Being able to produce contrast is essential to analyzing an instance of fixed segmentism as being morphological rather than phonological in nature (357, (25a)). Thus, examining the possibility that LINKING /i/ may be a form of phonological fixed segmentism is the most reasonable approach.

With this argument for analyzing LINKING V as a case of phonological fixed segmentism established, the constraints which justify classifying it as a product of TETU must be presented. LINKING V calls for three markedness constraints in addition to the six used for shaping and placing the reduplicant above. These additional constraints are as follows in (9), (10), and (11).

$$(9) \quad * \begin{bmatrix} -cons \\ -high \\ -low \end{bmatrix}$$

No vowels that are both [-high] and [-low] may be present.

This constraint militates against mid vowels, which are not present in contemporary Lak except as phonetic realizations of pharyngealized vowels. Historically, according to studies by E. A. Bokarev in 1961 and 1981 whose results are synthesized in Anderson (1997), /o/ did not exist in Proto-Daghestanian and /e/ became /a/. This is strong diachronic evidence for the constraint specified above.

Those same historical linguistic studies indicate that Proto-Daghestanian /u/ remained /u/ in all cases. The vowel /u/ can be considered to be marked because it seems to have a defined, rigid character that does not blend according to its environment. The constraint which captures the markedness of /u/ is presented below in (10).

$$(10) \quad * \begin{bmatrix} -cons \\ +round \end{bmatrix}$$

Round vowels are not permitted.

Because this constraint militates against a vowel which is less marked and still surfaces in contemporary Lak, it is ranked lower than the constraint in (9). Note here that two different standards of markedness are being used. The one that makes mid vowels marked is defined by whether or not the phoneme exists in contemporary Lak while the one that defines markedness in (10) and (11) is defined according

to the degree of mutability of the vowel in its evolution from Proto-Daghestanian to contemporary Lak. The implications of using these two standards will be discussed in section 6. For now, this work will continue to set forth the constraints that shape LINKING V and the rankings that produce a working OT analysis of Lak reduplication.

The historical studies synthesized by Anderson (1997) show that original Proto-Daghestanian /a/ stayed /a/ or became /u/ “after labialized consonants in closed syllables” (Anderson 1997:987). The vowel /a/ is marked because it only blended under special circumstances and seemed to have a more defined, and therefore less mutable, character. The constraint in (11) models this markedness against /a/.

- (11) $\ast \begin{bmatrix} -cons \\ -high \end{bmatrix}$
No non-high vowels are permitted.

The segment /i/, however, not only survived from Proto-Daghestanian, it blended with adjacent articulatory features in the least specialized circumstances of any vowel that was present in Proto-Daghestanian. It became /u/ “when adjacent to a labial(ized) consonant” (Anderson 1997:987). The ability of /i/ to blend with other articulatory features the most easily of any vowel and the fact that /i/ survived from Proto-Daghestanian suggest that /i/ is the least marked vowel in Lak. Therefore, no constraint militates against /i/, and thus /i/ is the only vowel segment that incurs no markedness violations. Because of this, /i/ emerges as the least marked solution to realizing LINKING V after the reduplicant. The way that the markedness constraints interact with each other combined with the way that FAITH-IO does not affect LINKING V produces a situation characteristic of phonological TETU.

4 Ranking Relations and Tableaux

4.1 Ranking Relations Grouped by Related Constraints

Several essential relations shape the complete ranking of the constraints which produce Lak reduplication and the shape of LINKING V. The schema for phonological TETU, presented again in (12), informs the most general constraint ranking.

- (12) FAITH-IO \gg MARKEDNESS \gg FAITH-BR (Alderete *et al.* 1999)

Included in this general schema is FAITH-IO, and with it REALIZE- μ . Because REALIZE- μ is a faithfulness constraint which requires that input morphemes have some phonological exponence (Yu 2005), it is of equal importance to FAITH-IO in realizing attested verb forms. FAITH-BR is the lowest ranked of all the constraints. While the reduplicant must be faithful to its origin in the base to surface as a *reduplicant*, as opposed to some other segment whose relation to the base is opaque, the reduplicant is shaped by markedness constraints that dominate FAITH-BR.

Two relations linked to the adequate realization of the input morphemes inform the rankings among the markedness constraints. The first relation is the ranking which produces the attested form of the reduplicant. *VV and *STRUC-σ are equally important in shaping the reduplicant as a single consonant. However, because the form of the consonant which acts as the reduplicant must sometimes be supplied by the verbal root's onset consonant rather than by its coda (in the case of roots composed of open syllables), *VV and *STRUC-σ must dominate R-ANCHOR-BR. The latter constraint causes association between the right edge of the reduplicant and the right edge of the base (McCarthy and Prince 1995; Kager 1999), and if it were undominated, it would copy the null coda of bases composed of open syllables. This would violate the highly-ranked REALIZE-μ and lead to unattested Lak verbal forms.

The second relation that shapes the ranking of markedness constraints is the ranking of vowel markedness that causes LINKING V to surface as /i/. The ranking among these constraints is shown in (13).

$$(13) \quad * \begin{bmatrix} -cons \\ -high \\ -low \end{bmatrix} \gg * \begin{bmatrix} -cons \\ +round \end{bmatrix}, * \begin{bmatrix} -cons \\ -high \end{bmatrix}$$

This ranking ensures that mid vowels are more marked than round vowels and low vowels. The least marked option, then, is a high, unrounded vowel, and /i/ fits that description. LINKING V, therefore, surfaces as an example of phonological TETU by the fact that it surfaces as /i/, the least marked vowel segment.

4.2 Complete Ranking

The discussion above outlines general relationships among the constraints, but does not produce their complete ranking. FAITH-IO and REALIZE-μ rank most highly. Following them are *VV and *STRUC-σ, which are both of equal importance for shaping the reduplicant. Because mid vowels do not surface independently in Lak

(only as phonetic realizations of pharyngealized /i/ and /u/), $* \begin{bmatrix} -cons \\ -high \\ -low \end{bmatrix}$ is ranked

equally with *VV and *STRUC-σ. This ranking group dominates R-ANCHOR-BR, which must be violated in order to accommodate the attested reduplicant of verbal roots with open syllables (such as in suppletive verbs like *zun* 'to work').

Ranked equally with R-ANCHOR-BR are $* \begin{bmatrix} -cons \\ +round \end{bmatrix}$ and $* \begin{bmatrix} -cons \\ -high \end{bmatrix}$. These two constraints must be dominated by the constraint against mid vowels since /u/ and /a/ surface in contemporary Lak and are therefore less marked than any mid vowels. However, these vowels are still marked due to their more specific, less mutable character. Finally, the lowest ranked constraint, which nonetheless must be present in order to produce a transparent relationship between the reduplicant and its base, is

FAITH-BR, which is dominated by R-ANCHOR-BR, $\ast \begin{bmatrix} -cons \\ +round \end{bmatrix}$, and $\ast \begin{bmatrix} -cons \\ -high \end{bmatrix}$.
The complete ranking, then, is presented below in (14).

$$(14) \quad \text{FAITH-IO, REALIZE-}\mu \gg \ast \text{STRUC-}\sigma, \ast \text{VV}, \ast \begin{bmatrix} -cons \\ -high \\ -low \end{bmatrix} \gg \text{R-ANCHOR-} \\ \text{BR}, \ast \begin{bmatrix} -cons \\ +round \end{bmatrix}, \ast \begin{bmatrix} -cons \\ -high \end{bmatrix} \gg \text{FAITH-BR}$$

4.3 Tableaux

The following tableaux and their explanations show how the complete constraint ranking given in (14) accounts for attested Lak verbal forms. The inputs in the tableaux consist of morphemes arranged in the order in which they must surface. It is assumed that the morphology of Lak arranges these morphemes in the correct order and that no further constraints are necessary in the phonology for that purpose. First, a tableau is presented for the word *ħač'lač'issa*, the durative present participle of 'drink,' which has the root *ħač'*-. The explanation will begin with the worst violations and conclude with the optimal candidate.

(15)

/[h ₁ a ₂ č ₃]-] _{ROOT} , la, RED, LINKING V, ssa/	FAITH- IO	REALIZE- μ	*STRUC- σ	*VV	*[-cons] [-high] [-low]	R- ANCHOR -BR	*[-cons] [+round]	*[-cons] [-high]	FAITH- BR
a) ø hač ₃ '-la-č ₃ '-i-ssa			****					***	*
b) hač ₃ '-la-k ₃ '-i-ssa			****					***	**!
c) hač ₃ '-la-č ₃ '-a-ssa			****					****!	
d) hač ₃ '-la-č ₃ '-u-ssa			****				*!	***	*
e) h ₁ ač ₃ '-la-h ₁ '-i-ssa			****			*!		***	**
f) hač ₃ '-la-č ₃ '-e-ssa			****		*!			***	*
g) hač ₃ '-la-a ₂ '-i-ssa			****	**!		*		****	*
h) h ₁ a ₂ č ₃ '-la-h ₁ a ₂ č ₃ '-i-ssa			*****!					****	
i) hač ₃ '-la-ø-i-ssa		*!	****	*				***	*
j) ø ač ₃ '-la-č ₃ '-i-ssa	*!		****					***	*

First, (15j) violates FAITH-IO because the suffix *-ssa* in the input surfaces unfaithfully as *-sqa* in the output. In (15i), the reduplicant morpheme is not realized with any phonological exponence in the output as REALIZE-μ requires. These two candidates violate the most highly ranked IO faithfulness constraints.

The following three candidates violate the most highly ranked *markedness* constraints. (15h) critically violates *STRUC-σ more than any other candidate by one mark because the entire closed verbal root is copied as the reduplicant. This adds an extra syllable, and thus an extra violation to the constraint. (15g) violates *VV twice because the vowel of the verbal root is reduplicated and causes one new long vowel combination, /aa/, and one new combination of vowels in hiatus, /ai/. Note that (15i) also violates *VV when the reduplicant is not realized since it puts the /a/ of the durative marker and linking /i/ together in hiatus. In (15f), the constraint against mid vowels, $*\begin{bmatrix} -cons \\ -high \\ -low \end{bmatrix}$, is violated because the linking vowel surfaces as /e/.

Likewise, after the candidates which violate the most highly ranked markedness constraints, the following three candidates violate the second most highly ranked markedness constraints related to those phenomena. (15e) violates R-ANCHOR-BR by associating the *left* edge of the reduplicant with the *left* edge of the base, not the right edge of both morphemes as the constraint demands. (15d) violates the constraint against round vowels, $*\begin{bmatrix} -cons \\ +round \end{bmatrix}$, because LINKING V surfaces as /u/.

(15c) violates the constraint against low vowels, $*\begin{bmatrix} -cons \\ -high \end{bmatrix}$, by letting /a/ surface as LINKING V. These candidates represent more optimal candidates than those violating previous constraints, and this reflects a trend toward decreasing markedness. This is especially important for the surfacing of LINKING V as /i/ as a result of phonological TETU.

Next, candidate (15b) incurs one more FAITH-BR violation than is optimal by unfaithfully reduplicating the coda consonant of the base as /k'/.

Finally, (15a) is the optimal candidate, since it faithfully reduplicates the coda consonant of the base. It incurs the least *STRUC-σ and $*\begin{bmatrix} -cons \\ -high \end{bmatrix}$ violations possible given the input. It also incurs the least FAITH-BR violations possible to satisfy more highly ranked markedness constraints and incurs no IO faithfulness violations whatsoever.

The next tableau in (16) is for the word *zuzissa*, which is the durative present participle of *zu-* ‘work.’ The root *zu-* lacks a coda, which makes it a good example of why some of the constraints are in place as they are. In the subsequent explanation, only constraints which are violated in a way that differs from the examples in the previous tableau will be discussed.

First, with open syllables, both *VV and *STRUC-σ eliminate full reduplication of the base since the base has a vowel as its final segment. Another point of interest is that open syllables are the reason why R-ANCHOR-BR must be ranked below the other two reduplicant shaping constraints, *VV and *STRUC-σ. If it were not

ranked below them, the initial consonant of the base would not be reduplicated, and this would cause an unattested form to emerge as the optimal candidate.

(16)

/[zu-] _{ROOT} , RED, LINKING V, ssa/	FAITH- IO	REALIZE- μ	*STRUC- σ	*VV	*[-cons] [-high] [-low]	R- ANCHOR -BR	*[-cons] [+round]	*[-cons] [-high]	FAITH- BR
a) \emptyset z ₁ u-z ₁ -i-ssa			***			*	*	*	*
b) z ₁ u-k'-i-ssa			***			*	*	*	**i
c) z ₁ u-z ₁ -a-ssa			***			*	*	**i	*
d) z ₁ u-z ₁ -u-ssa			***			*	**i	*	*
e) z ₁ u-z ₁ -e-ssa			***		*i	*	*	**	*
f) z ₁ u ₂ -z ₁ u ₂ -i-ssa			****i	*i			**	*	
g) z ₁ u-z ₁ - \emptyset -ssa		*i	**			*	*	*	**
h) z ₁ u-z ₁ -i-sqa	*i		***			*	*	*	*

5 Argument Against LINKING /i/ as Morphological Fixed Segmentism

In Alderete *et al.* (1999:328), the authors state about phonological fixed segmentism emerging from TETU that “the idea [...] is that noncopying of a base segment, with substitution of some fixed, default segment, decreases phonological markedness.” They define *morphological* fixed segmentism as the simultaneous realization of an affix with the realization of the reduplicant (328). On page 357, the authors present properties of morphological fixed segmentism and state that the affix is faithful to its input and that contrasts are possible by alternating the form of the affix.

With these definitions in mind, it is clear that LINKING V is not morphological fixed segmentism. LINKING V is realized like an affix, but faithfulness is irrelevant since only the existence of V, not its form, must be realized in the output candidates. Just as important, contrasts are not possible in the environment of LINKING /i/ since other vowels simply increase markedness and do not modify the meaning of the entire verb form.

6 Discussion of the Status of LINKING V as an Example of Phonological Fixed Segmentism

While LINKING /i/ is definitely not morphological fixed segmentism, it does not seem to fit all the specifications necessary to call it phonological fixed segmentism. First, LINKING /i/ does not result from “noncopying of a base segment” (328). It is present in the form of LINKING V in the input, and moreover, in stems containing the /i/ vowel, one cannot definitely determine from surface data whether linking /i/ is truly linking /i/ or a copying of the base. More importantly, it is difficult to argue that /i/ is a default segment for the language in general. If one looks through the lists of words borrowed into Lak in Khajdakov’s *Essays on the Lak Lexicon* (1961), it becomes clear that there is not simply one default segment that fulfills the function of resolving illegal consonant clusters in all contexts. The vowel /i/ functions in some of these contexts, as in the loan *pikri* from Arabic *fikr* (Khajdakov 1961:54), but not in a similar one where it may be expected. For example, Arabic *fakhr*, which one may expect to yield Lak **pakhri*, in fact yields *pakhru*. The stem vowel seems to have a much greater effect than any conception of non-/i/ vowels being marked.

Finally, the notions of markedness that inform the constraints against mid vowels, round vowels, and non-high vowels are not satisfactory. It is clear that mid vowels are marked since they do not appear in contemporary literary Lak. However, claiming that round vowels and non-high vowels are marked due to their different evolutionary paths from Proto-Daghestanian is highly dubious and probably incorrect in the end, especially in light of evidence such as that presented above from Khajdakov (1961:54). It is dubious because the definition of “markedness” uses

a double standard. Markedness in the cases of non-high vowels and round vowels is evaluated according to the degree of mutability of a vowel's quality through the evolution from Proto-Daghestanian to contemporary Lak while markedness in the case of mid vowels is calculated according to whether those segments surface in the contemporary language. By this latter standard of markedness, round and non-high vowels are not marked at all since they appear frequently in contemporary literary Lak. However, without a way to motivate the markedness that is needed to bring about proper reduplicative forms in Lak, the OT analysis is somewhat *ad hoc*. While the appropriateness of the second standard of markedness defined according to evolutionary vowel mutability is questionable, it can at least claim some substantive historical evidence from Anderson (1997) as its basis.

7 Conclusion

Reduplication in Lak can be concisely modeled in OT using a TETU ranking schema and nine cross-linguistically viable constraints. Two grades of ranking among the markedness constraints produce the proper surface form of the reduplicant and accomplish the manifestation of LINKING V as /i/. The surface form of LINKING V can be modeled as a case of TETU in that /i/ can be justified as the least marked option for the surfacing of a vowel in Lak. Analyzing LINKING /i/ as a case of phonological fixed segmentism (Alderete *et al.* 1999), however, seems to be inappropriate despite the facts that LINKING /i/ is fixed in position and that replacing it with another vowel does not produce a contrastive meaning, but only ungrammaticality. The vowel /i/ (LINKING V's manifestation) only decreases phonological markedness when markedness is defined according to a double standard. The standard of markedness that must be used to motivate analyzing round and non-high vowels as marked is founded on a small portion of historical data and should, considering Lak loanword phonology such as that which can be constructed from Khajdakov (1961), ultimately be rejected on the grounds that a single standard of markedness should be used to avoid *ad hoc* double standards.

Thus, the theory of fixed segmentism (Alderete *et al.* 1999) is effective in showing that LINKING /i/ is not an instance of morphological fixed segmentism. However, it cannot show that LINKING /i/ is an instance of *phonological* fixed segmentism because it cannot be claimed for certain that the manifestation of LINKING V as /i/ truly decreases markedness. This begs the question of what LINKING /i/ actually is, morphologically or phonologically speaking, and provides an opportunity for additional research into how to best predict and account for its presence.

References

- Alderete, John, Jill Beckman, Laura Benua, Amalia Gnanadesikan, John J. McCarthy, and Suzanne Urbanczyk. 1999. Reduplication with fixed segmentism. *Linguistic Inquiry* 30.327–364.
- Anderson, Gregory. 1997. Lak phonology. In *Phonologies of Asia and Africa (Including the Caucasus)*, ed. by Alan S. Kaye and Peter T. Daniels, 973–997. Eisenbrauns.
- El'darova, Roza G., 1999. *Lakskij glagol: uchebnoe posobie (The Lak Verb: an Academic Textbook)*. Makhachkala, Dagestan, Russia: Dagestan State University dissertation.
- Friedman, Victor. 1989. On the terminology for lak synthetic past paradigms. *The Non-Slavic Languages of the USSR: Linguistic Studies* 106–120.
- Kager, René. 1999. *Optimality Theory*. Cambridge University Press.
- Khajdakov, S. M. 1961. *Ocherki po leksike lakskogo jazyka (Essays on the Lak Lexicon)*. Moscow: Publisher of the Academy of Sciences.
- Khajdakov, S. M. 1962. *Laksko-russkij slovar' (Lak-Russian Dictionary)*. Gosudarstvennoe Izdatel'stvo Inostrannykh i Natsional'nykh Slovaroj (State Publisher of Foreign and National Dictionaries).
- Khajdakov, S. M. 1966. *Ocherki po lakskoj dialektologii (Essays on Lak Dialectology)*. Moscow: Nauka (Science).
- Marantz, Alec. 1982. Re reduplication. *Linguistic Inquiry* 13.483–545.
- McCarthy, John, and Alan Prince. 1995. *Faithfulness and Reduplicative Identity*, 249–384. Amherst, Mass.: GLSA.
- Murkelinskij, G. B. 1971. *Grammatika lakskogo jazyka (A Grammar of the Lak Language)*. Makhachkala, Dagestan, Russia: Dagestanskoe Uchebno-Pedagogicheskoe Izdatel'stvo (Dagestan Educational-Pedagogical Publishing).
- Yu, Alan C. L. 2005. Quantity, stress, and reduplication in washo. *Phonology* 22.437–475.