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SOUTHERN PAIUTE AND NUMIC FINAL FEATURES[1]

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0. The Numic branch of Uto-Aztecan (UA) has a peculiar set of phonological elements in morpheme-final position which affect the immediately following consonant. Although the present Numic languages vary in their "final feature" systems, a reconstruction of a three-way system in Proto-Numic is fairly clear: spirantizing (-^{s}), geminating (-^{g}), and nasalizing (-^{n}).[2] These elements probably represent a further development of Proto-Uto-Aztecan (PUA) phonological processes, inasmuch as spirantization is a form of UA intervocalic lenition and gemination resembles UA processes of preconsonantal glottal stop and /h/.

The three-way final feature system is preserved in SP as exemplified (SP data are from Sapir 1930):

[1] A version of this article was presented at the Sixth Uto-Aztecan Conference, Reno, Nevada, June 1978. I wish to thank Ray Freeze, Wick Miller, and Ken Tokaichi for comments on various drafts of the paper.

[2] For convenience I follow Sapir's convention of superscripts (-^{s}, -^{g}, -^{n}) to indicate the final features. There are other conventions for representing these features. See Iannucci (1973) and Miller (1980) for further discussion of Numic final features.

Chomsky and Halle (1968:344–49) give a synchronic treatment of Southern Paiute (SP) final features and stress. They account for final features by positing an underlying morpheme structure that ends in a vowel, obstruent, or nasal; morpheme-final obstruents and nasals surface, after undergoing assimilation, when they occur immediately before a consonant, but are dropped when they come before a vowel or are in word-final position. Though my diachronic analysis is not intended to make strong synchronic claims, it does nevertheless agree in certain respects with the analysis by Chomsky and Halle.

In order that the analysis remain brief and the main points clear I have glossed over SP phonological detail and omitted all but the essential particulars about the phonologies of other UA languages.

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Spirantizing

(1) /ta-^{s}/ + /-tu?i-/ → [taro?i-]
hot become 'to be hot'

Geminating

(2) /ši-^{g}/ + /-tu?i-/ → [šittu?i-]
cold become 'to be cold'

Nasalizing

(3) /niŋwi-^{n}/ + /-pi/ → [niŋwimpi]
liver ABS 'a/the liver'

In (1) the /t/ immediately following the spirantizing morpheme surfaces as [r]; in (2) the /t/ surfaces as [tt]; and in (3) the /p/ occurs in nasalized form as [mp].

1. Reduplication, as one likely source of final features, provides a good point of departure since it is an environment in which final features participate fully. I first present a historical model for final feature development in Numic reduplication and then give supportive data from present-day SP.

In early Proto-Numic, I hypothesize that a common form of reduplication was:

$$[C_1V_1X\ V_2]_{stem} \rightarrow C_1V_1X\text{-}[C_1V_1X\ V_2]$$

which would have developed from CVXV-CVXV through loss of the vowel in the second syllable. (Cf. Heath 1977 for a reconstruction of CVCV- for Proto Numic and Northern UA reduplication.) During this stage, the first three elements C_1V_1X are reduplicated onto the stem; X is a nasal or a nonnasal consonant or $\emptyset$. Later on in Numic the reduplicated X was "absorbed" by the reduplicated C_1V_1 syllable and its earlier status was manifested by the spirantizing, geminating, or nasalizing of the following consonant, C_1 of the stem. When X was $\emptyset$ a spirantizing final feature developed, when a nonnasal consonant a geminating feature, and when a nasal a nasalizing feature:

$$[C_1V_1X\ V_2] \rightarrow C_1V_1\text{-}^{s,g,n}\text{-}[C_1V_1X\ V_2].$$

The spirantizing development is straightforward, since the reduplicated form $C_1V_1\emptyset_x$-$C_1V_1V_2$ has the first consonant of the stem in intervocalic position, which is a natural environment for lenition (spirantization here).

The development of the geminating feature is somewhat more complicated. The reduplicated form $C_1V_1C_x$-$C_1V_1X\ V_2$ contains the consonant cluster C_xC_1. However, Numic generally does not allow consonant clusters except for an occasional /?C/ or /hC/. The following intermediate stage is therefore proposed for the geminating feature development:

$$C_1V_1C_x\text{-}C_1V_1C_xV_2 \quad > \quad C_1V_1G\text{-}C_1V_1C_xV_2.$$

Here, the reduplicated C_x became a glottal (G). This stage is needed not only to account for the consonant cluster, but also to explain a phonological phenomenon associated with the geminating final feature. In SP glottals often cause "overglottalization" (Sapir's term) in which nonunderlying glottal stops and accompanying gemination occur later in the word. Geminating prefixes and stems with no apparent glottal also tend to cause overglottalization (cf. Sapir 1930).

The nasalizing feature in reduplication simply developed when X was **m* or **n*.

Although there is good evidence in present-day SP for the nasalizing rule (as noted by Sapir 1930:256) and the spirantizing rule, evidence for the geminating rule is preserved only in certain forms. Consider first spirantizing reduplication in SP:

(4)	*poo*	'trail'	*povoo*	'trails'
(5)	*pia-*	'mother'	*piviaraŋWA*	'our incl. mothers'
(6)	*kwɨɨ-*	'to take one object'	*kwɨɣwɨɨ*	'several take one object'

In (4)–(6) X is ∅, and thus the first consonant of the stem is spirantized: *povoo*, *piviaraŋWA*, *kwɨɣɨɨ*. When X is a nonnasal consonant, gemination results:

(7)	*pAhkaŋU*	'to kill one person'	*pAhpakkaŋU*	'several kill one person'
(8)	*payɨ*	'to return'	*pappahyɨ*	'return DISTR.'
(9)	*tahpukkwi*	'to jump'	*tAhtappUkwih*	'keeps jumping'

(Unstressed vowels are often devoiced and geminate consonants that immediately follow are preaspirated and degeminated; [hp] and [ht] are therefore considered geminate. Cf. Miller 1980:153.) SP reduplication in which X is a nasal involves assimilation (*ŋk*, *nt*, *mp*):

(10)	*kanI*	'house'	*kaŋkanI*	'houses'
(11)	*tonaih*	'stabs'	*tonton?Ahkaih*	'several stab'
(12)	*ponnaa*	'to stoop and stick out one's buttocks'	*pompon?naih*	'stoops several times and . . .'

Nasalizing reduplication is often accompanied, as is geminating reduplication, by overglottalization, as seen in (11) and (12). This probably reflects the consonantal nature of the nasalizing feature, leading to

speculation that it may actually be a special form of the geminating feature. This type of interplay conceivably led to some of the differences among the final feature systems of the various Numic languages.

2. Comparison of reconstructed PUA forms with SP forms also provides hints about the origin of final features. Below are spirantizing SP roots and corresponding PUA forms (PUA reconstructions are from Miller 1967; in some cases I have added a final vowel (V) to give the form a more typical UA CVCV shape):

	PUA	SP	
(13)	**kwase*	*kwaši-*^{s}	'be ripe'
(14)	**pite*	*pici-*^{s}	'arrive'
(15)	**puku*	*puŋku-*^{s}	'dog'

The SP spirantizing forms show no consonant loss in their development from PUA, suggesting that here the spirantizing feature developed from ∅ as it did in reduplication.

In geminating roots, however, there is sometimes consonant loss, which implies that the geminating feature is a consequence of that loss:

(16)	**sepV*	*ši-*^{g}	'cold'
(17)	**kuci*	*ku-*^{g}	'smoke'
(18)	**wepV*	*wi-*^{g}	'whip'

The derivation of (17) 'smoke' would be:

**kuci-* > **kuc-* > **kuG-* > *ku-*^{g}.

It is not surprising that geminating roots tend to be shorter than spirantizing roots, often monosyllabic. This would result when the more common PUA disyllabic CVCV form lost its final vowel and then consonant. In addition, many of the instrumental prefixes are monosyllabic and geminating, and it is likely that they too originate from disyllabic roots. On the whole geminating roots are much less common than spirantizing ones, which is expected since roots would naturally become spirantizing unless they experienced consonant loss.

There are, nevertheless, a number of geminating roots that do not appear to involve merely a final consonant loss:

(19)	**ʔawa*	*ʔaa-*^{g}	'horn'
(20)	**muhu*	*muhu-*^{g}	'owl'
(21)	**ʔoha*	*oa-*^{g}	'yellow'

These imply that the power of the glottal within the root was extended outside the root, thereby geminating the first consonant of the following morpheme. Such overglottalization (or overgemination) came to be obligatory and was preserved in the form of a geminating final feature, even when the actual glottal(s) in the root was (were) lost, as in (21).

Nasalizing roots, naturally enough, developed from PUA roots containing a nasal:

(22)	**huna*	*ɨna-*^{n}	'badger'
(23)	**meye*	*mɨyɨ-*^{n}	'gopher'
(24)	**tem*	*tɨ-*^{n}	'rock'

These roots apparently did not always develop as a direct result of the loss of nasal consonants, rather, "overnasalization" occurred, by which nasals within the root triggered the final nasalizing feature. This often produced nasals later in the word as well, resembling unmistakably overglottalization (cf. Sapir 1930).

Throughout Numic there is a certain amount of disagreement concerning final features. For example, some geminating roots in one language are spirantizing in another. It is quite conceivable that the variations in stress systems among Numic languages provided environments for developing such differences. (SP has alternating stress from left to right on even morae; Shoshoni has alternating stress from left to right on odd morae; Mono has alternating stress from right to left on even morae; cf. Miller 1980.) It is not difficult, for instance, to imagine how the SP stress pattern could have facilitated the geminating final feature of monosyllabic roots and prefixes. Since SP has basically a CVCV́CVCV́CV . . . stress pattern, the syllable immediately following the monosyllabic root of the prefix is usually stressed. The stressed syllable provides a natural environment for the strengthening (geminating) of its consonant.

3. The data here generally fit the proposed analysis, and yet there are a number of unexplainable forms not presented that may represent as much as a fourth of the total SP data. These illustrate not so much a problem with the analysis as they reflect the complicated nature of language change. Over the years the original final feature system was doubtless modified and its origins obscured by later phonological rules.

The main conclusions of this article are here summarized. (1) The spirantizing final feature is a type of specialized UA intervocalic lenition found in forms experiencing no final consonant loss. (2) The geminating final feature in some cases is the remnant of a final protoconsonant, which perhaps passed through an intermediate glottal stage as it was lost. In other cases this feature must be considered an extension of overglottalization. (3) The nasalizing final feature, which derived through the loss of or in the environment of a nasal, is still productive in SP reduplication and suggests the origin of the other final features.

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