The Genetic Unity of Southern Uto-Aztecan

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Abstract

The internal structure of the Uto-Aztecan language family has been debated since the late 19th century, when the historical relationships among all of its major subdivisions were first recognized. Alexis Manaster Ramer's identification in 1992 of a phonological innovation shared by languages belonging to the four northernmost subfamilies led to the acceptance of these languages as a genetic linguistic unit called Northern Uto-Aztecan, but no consensus has emerged regarding the organization of the remaining five subfamilies into higher-level subgroups. In this essay, I argue in support of a perspective, originally developed by Terrence Kaufman, that these languages also constituted a genetic unit, Southern Uto-Aztecan, based on two shared, sequential innovations: *-n- > * -r- and *-ŋ- > *-n-. Key to my argument is the reconstruction of a Proto-Uto-Aztecan liquid phoneme with **[-r-] and **[-l-] as its allophones, which clarifies the diachronic relationships among reflexes of ** -n-, **-ŋ-, and **-r- in the daughter languages. The model that I propose offers a parsimonious solution to several perennial issues in Uto-Aztecan historical phonology and a possible explanation for the absence of a liquid phoneme in the Numic languages.

Uto-Aztecan, Numic, subgrouping, shared innovation, typology

The Genetic Unity of Southern Uto-Aztecan

1. Introduction. The Uto-Aztecan language family comprises thirty languages that, at the time of initial European contacts, were spoken from Central America to just north of the Great Basin of western North America (Fig. 1). A number of other languages, now extinct, may also have been Uto-Aztecan, but insufficient documentation exists to determine their affiliation (Sauer 1934; Lastra de Suárez 1973:355-360; Miller 1983a, 1983b; Campbell 1997:133-135; Caballero 2011).

[Insert Fig. 1 about here]

A conservative classification of the Uto-Aztecan (UA) languages organizes them into nine subfamilies (Table 1). The four northernmost subfamilies—Numic, Hopi, Tubatulabal, and Takic—can be grouped into a single, higher-level branch known as Northern Uto-Aztecan (NUA) on the basis of a shared phonological innovation: the shift, in intervocalic position, of the affricate *-c- to the glide *-y- (Manaster Ramer 1992). The languages in the other five subfamilies—Tepiman, Taracahitan, Tubar, Corachol, and Aztecan—are frequently classified together as Southern Uto-Aztecan (SUA) because of phonological and lexical similarities among them (Miller 1984; Cortina-Borja et al. 2002). To date, however, no shared phonological, morphological, or syntactic innovations have been identified that Uto-Aztecanists agree definitely establish SUA as a genetic unit (Miller 1983a:117-118; Campbell 1997:136-137; Hill 2001:917-919; Stubbs 2003:1-7). In the absence of such evidence, the default conclusion is that the ancestral language of each of the SUA subfamilies descended, along with Proto-Northern Uto-Aztecan (PNUA), directly from Proto-Uto-Aztecan (PUA).

[Insert Table 1 about here]

In this essay, I offer evidence in support of a perspective advocated by Kaufman (1981:156-

172) and accepted by Miller (1994:315-316) that the SUA languages derived from a common ancestral language, Proto-Southern Uto-Aztecan (PSUA), the existence of which is indicated by two phonological innovations shared across the SUA subfamilies: 1) the shift in non-initial position of *-n- to *-r- (which could also be represented as *-l-) and 2) the shift in both initial and non-initial position of the velar nasal *ŋ to *n. The possibility of these shifts is suggested by well-established correspondences between the NUA and SUA languages: 1) *-n-* in the NUA languages regularly corresponds to a liquid phoneme, either *-r-* or *-l-*, in the SUA languages and 2) /ŋ/ in the NUA languages regularly corresponds to /*n*/ in the SUA languages.

The significance of these correspondences for an understanding of the history of the Uto-Aztecan languages varies depending upon which of these liquid and nasal phonemes are reconstructed for the phonemic inventory of Proto-Uto-Aztecan and the reflexes of these phonemes that are postulated for the NUA and SUA languages. The three principal alternatives that have been proposed previously are summarized in Table 2, along with a fourth alternative that I will explore in this essay.

[Insert Table 2 about here]

In the first alternative, **ŋ and **-r/l- are reconstructed for PUA.[1] PUA **ŋ is retained in the NUA languages, shifting to *n* in the SUA languages, while PUA **-r/l- is retained in the SUA languages, shifting to *-n-* in the NUA languages (Sapir 1915:315-318; Voegelin, et al. 1962: 122-124). In the second alternative, **n and **-r/l- are reconstructed for PUA and both are

1. The grapheme <-r/l-> is used to indicate that a single phoneme is involved, usually represented in the Uto-Aztecan literature by <l> but sometimes by <r>. In keeping with standard practice in UA historical linguistics, a double asterisk marks sounds and words reconstructed for PUA while a single asterisk marks sounds and words reconstructed for the intermediate proto-languages.

retained in the SUA languages, shifting to ŋ and -*n*- respectively in the NUA languages (Hill 2011). In the third alternative, **ŋ and **-n- are reconstructed for PUA and both are retained in the NUA languages while in the SUA languages **ŋ shifts to *n* and **-n- shifts to -*r*/*l*- (Kaufman 1981:156-172; Miller 1994:315-316).[2]

Sorting out the historical relationships among ŋ, *n*, *r*, and *l* has been a perennial challenge in UA comparative linguistics, and no consensus has emerged regarding which alternative is preferable (Campbell 1997:136-137; Dakin 2001; Dakin 2007; Hill 2001:919; Hill 2011; Stubbs 2011:20-30). Here I offer a way of moving beyond this impasse by arguing that a liquid phoneme must be reconstructed for Proto-Uto-Aztecan, based on the regular correspondence of medial -*r*- and -*l*- in all Uto-Aztecan languages except those of the Numic subfamily. As suggested by Whorf (1935), Voegelin, et al. (1962:128), Kaufman (1981), and Stubbs (2011:26-28), this liquid phoneme is distinct diachronically from the liquid phoneme in the SUA languages that regularly corresponds with -*n*- in the NUA languages. I label it PUA **r to avoid confusion with the PUA **l proposed in previous studies, but it could equally be labelled **l because the available evidence indicates that both *[-r-] and *[-l-] were its allophones.

By my analysis, PUA **r was the primary source of -*r*/*l*- in the NUA languages.[3] In the SUA languages, -*r*/*l*- regularly corresponds with both NUA -*r*/*l*- and NUA -*n*-. The most parsimonious

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2. A fourth alternative is possible but I am not aware that anyone has proposed it. The derivations and correspondences are: a) PUA **ŋ > NUA /ŋ/ :: SUA /*n*/ and b) PUA **-n- > NUA -*r*/*l*- :: SUA -n-.

3. Several attestations of intervocalic -*l*- in Tubatulabal and the Cupan languages derive from PNUA *-t-, with Tubatulabal and Cupan -*l*- regularly corresponding to -*t*- in SUA cognates. In addition, a shift of /*w*/ to /*l*/ occurred in some Hopi words in the environment of the low vowels /*a*/ and /*ö*/ (Voegelin, et al. 1962:53). Where SUA cognates are attested for these words, the regular correspondence in most languages is -*w*-.

accounting for the correspondence of NUA *-n-* and SUA *-r/l-* is that PUA **-n- shifted to PSUA *-r/l-. Because this shift precludes PUA **-n- as the source of PSUA *-n-, the logical source of PSUA *-n- is PUA **-ŋ-, given the regular correspondence of SUA *-n-* and NUA -ŋ-. These three sets of regular correspondences, presented as Alternative 4 in Table 2, thus require that **r, **ŋ, **n be reconstructed for the PUA phonemic inventory and that the shifts of PUA **n to PSUA *-r/l- and PUA **ŋ to PSUA *n be identified as two phonological innovations shared by the SUA languages.[4] These shared innovations in turn establish the genetic unity of the SUA languages and Proto-Southern Uto-Aztecan as the daughter language of Proto-Uto-Aztecan coordinate with Proto-Northern Uto-Aztecan.

In the next section, I summarize the evidence supporting the reconstruction of PUA **-r-. I then present, in sections 3 and 4, cognate sets that document the correspondences of NUA *-n-* :: SUA *-r/l-* and NUA ŋ :: SUA *n*. In section 5, I review the principal counter-evidence to my perspective: six cases in which *-n-* in some NUA languages appears to correspond with *-n-* in some SUA languages. I conclude the essay with a consideration of the implications of my analysis for an understanding of the early diversification of the Uto-Aztecan language family.

[Insert Table 3 about here]

2. Proto-Uto-Aztecan **r

4. Kaufman (1981:156-172) also reconstructed PUA **r, **ŋ, **n, but he did not link the two SUA innovations modeled in the third alternative to the reconstruction of PUA **r, which in my scenario is key. Another difference is that I reconstruct **[-r/l-] as an allophone of **/r/, while Kaufman (1981:162-163, 166-167) reconstructed **[-r/l-] as the medial allophone of **/n/, which had **[n-] as its allophone in initial position. At the same time, he entertained the possibility that PUA **[-n-] rather than **[-r/l-] was the medial allophone of PUA **/n/ and that PUA **[-n-] shifted to SUA *[-r/l-], a view that corresponds to mine. However, he offered no suggestions for determining whether **[-n-] or **[-l-] was the more likely reconstruction, simply observing that both were plausible (1981:166). In my model, only **-n- > PSUA *[-l-] is possible.

All Uto-Aztecan languages except those of the Numic subfamily have a liquid phoneme, either a rhotic /*r*/, a lateral /*l*/, or both.[5] As seen in Table 3, the distribution of /*r*/ and /*l*/ crosscuts subfamily boundaries, and the Takic and Taracahitan languages vary among themselves in which of these phonemes are represented in their phonemic inventories. Three categories emerge:

- Languages with both /*r*/ and /*l*/. NUA: Hopi, Luiseño. SUA: Tepiman, Mayo, Yaqui
- Languages with /*r*/ only. NUA: Kitanemuk. SUA: Eudeve, Cora, Huichol
- Languages with /*l*/ only. NUA: Tubatulabal, Cahuilla, Cupeño. SUA: Warihó, Rarámuri (18th century), Aztecan

A single liquid phoneme with rhotic and lateral allophones is reported for Warihó and Tubar[6] (Miller 1996:36-38 ; Lionnet 1978:18-19) and can be reconstructed for eighteenth-century Rarámuri based on data collected between 1761 and 1767 by the Jesuit missionary Matthäus Steffel (Steffel 1809).[7] A comparable relationship likely existed in Proto-Tepiman. Bascom

5. In the Numic languages, [*r*] is an allophone of the phoneme /*t*/. Realized in most cases as a tap or flap, it is the result of the lenition of [*t*] in intervocalic contexts (Armagost and McLaughlin 1992, 1993).

6. In Warihó, the allophone [*r*], realized as a flap, is in complementary distribution with [*l*] in intervocalic, pretonic position: [*r*] occurs before /*e*, *i*, *u*/ and [*l*] before /*a*, *o*/ (Miller 1996:38). Tubar /*r*/ is reported to have had three allophones: [*r*], [*l*], and [*ɬ*]. Their distribution and the sound value of [*ɬ*] cannot be precisely determined because Tubar is no longer spoken. C.V. Hartman, who compiled the only detailed record of the language, described [*ɬ*] as a "thick l nearly as r" (Lionnet 1978:14,18-19).

7. The liquid phonemes in modern Rarámuri can be analyzed as a lateral /*l*/, with a retroflexed alveolar flap [ɽ] and a post-alveolar retroflexed lateral flap [ɭ] as its allophones, and a rhotic /*r*/, with a trill [*ŕ*] and an alveolar flap [ɾ] as its allophones (Burgess 1970:47-49, 1984:7-8; Lionnet 1972:12-13; Caballero 2008:26, 42-44). These phonemes and allophones appear to derive from antecedent /*l*/ and /*t*/, as the result of two phonological changes: 1) the shift in initial position of the voiceless stop [*t*-] to the voiced alveolar trill [*ŕ*-], and 2) the delateralization in most contexts of the intervocalic lateral flap. A similar reworking of the relationships among [*t*], [*r*], and [*l*] appears to have occurred in Warihó (Miller 1996:36-38).

(1965:7) reconstructs PTep */r/, with the allophone *[*l*] occurring before */*i*/ and the allophone *[*r*] in other contexts. These allophones were phonemicized in the Tepiman languages as /*l*/ and /*r*/, with /*r*/ replaced in Upper Piman by the voiced retroflexed alveolar stop /*ɖ*/.

The phonemecization of *[*r*] and *[*l*] may also have taken place in Hopi, Luiseño, Mayo, and Yaqui, the only other UA languages with both /*r*/ and /*l*/ phonemes. In Hopi, /*r*/ and /*l*/ display near-complementary distribution in some contexts; in initial position, for example, /*r*/ occurs before /*i*/ and /*ï*/ while /*l*/ does not. In Luiseño, /*l*/ has a broader distribution than /*r*/. Luiseño /*l*/ is attested before and after all five Luiseño vowels and occurs in initial, medial, and final positions. In contrast, /*r*/ does not appear in final position at all nor in word-initial position before /*u*/, and intervocalically in root morphemes, it is attested almost exclusively following /*a*, *o*, *u*/. In Mayo and Yaqui, the two phonemes precede and follow all vowels, but they also alternate with one another in a number of words (e.g., My *čooli ~ čoóri* 'wrinkled', Yq *túʔule ~ túʔure* 'to like').[8] In addition, /*l*/ occurs in geminates and in syllable- and word-final position while /*r*/ does not.

*2.1. PUA **r in medial position*

The reconstruction of a PUA liquid phoneme in medial position is supported by ten cognate sets that document the regular correspondence of *-r-*/*-l-* in both NUA and SUA languages. Six verbal etyma are represented in the sets, along with four nominal etyma that are all associated with

8. For Arizona Yaqui, Molina, et al. (1999:284) report an expressive application of the /*-r-*/ ~ /*-l-*/ alternation, in which /*-l-*/ conveys a sense of affection while /*-r-*/ has derogatory connotations. In Huichol, /*r*/ is replaced by lateral and alveolar flap allophones in songs, baby talk, and "...any context involving diminution, endearment, or cuteness" (Grimes 1955:31). In contrast to Arizona Yaqui, this stylistic alternation also involves the palatalization of three other alveolar phonemes /*t*/, /*c*/ and /*n*/, as well as multiple shifts of the voiced retroflex sibilant /*z*/: to the voiceless retroflex sibilant [ʂ], the voiced and voiceless alveolar sibilants [*z*] and [*s*], and the dental fricative [*θ*].

birds. The possibility that the nominal etyma are not cognates but rather independent innovations that simply imitate the birds' characteristic sounds is considered in section 2.3 and in Appendix 2: BIRD.

Five of the ten sets are presented in this section. The other five sets, included in Appendix 2 under BIRD, LOOK FOR, RING, SHAKE, and SWALLOW, include fewer cognates but they display the expected NUA-SUA correspondences in *-r/l-* and other sound segments. The cognates in each set are organized by subfamily. The abbreviations used for the Northern Uto-Aztecan subfamilies are NUM (Numic), TUB (Tubatulabal), HOP (Hopi), and TAK (Takic), and for the Southern Uto-Aztecan subfamilies, TEP (Tepiman), TRC (Taracahitan), TBR (Tubar), CRC (Corachol), and AZT (Aztecan). The abbreviations for specific languages and the source or sources of the data for each are found in Appendix 1.[9] The "S-" followed by a number that appears in parentheses after each reconstructed PUA etymon correspond to the number of the relevant set or sets in Stubbs (2011) (see Appendix 2). These reconstructions should be regarded as approximations. Many regular phonological correspondences among the UA languages remain unidentified, especially in the second syllables of disyllabic morphemes. In addition, the reconstruction of several basic features of PUA phonology, like stress and vowel length, remain problematical.

The first three sets have cognates in at least two NUA subfamilies and two SUA subfamilies.

(1) 'to bend, curve, turn, return'. PUA **ŋora. (S-455). TUB: *noʔlat* ~ *ʔono:l* 'to go

9. In most sets, the subfamily but not the specific language abbreviations is used for the Tubatulabal, Hopi, and Tubar words, because these languages are the only documented members of their subfamilies. Citations of the principal published compilations of Uto-Aztecan cognate sets are given in Appendix 2, where I explain the criteria I have used to identify cognates and my orthographic conventions.

home'. HOP: *ŋölöla* 'to bend, to crook'. Hp *ŋöla* 'hoop, ring (n)'. TAK: Ls *ŋé:la* 'to be turned, be curved'. TEP: To *noɻ* 'to turn, bend, return'. PYp *nor ~ norgia* 'to turn'. PYp *norag* 'to return'. NT *norági-* 'to go back'. ST *nórgi-* 'to go back'. TRC: Ed *norón* 'to go back, come back'. Wr *noʔláni ~ noʔáni* 'to go someplace and return'. Rr *norína* 'to come back'. AZT: Na-Cl(M) *noloa* 'to bend (vt)'. Na-Cl(M) *noliwi* 'to become bent'.

(2) 'to open'. PUA **pïrV-.[10] (S-1578). TUB: *pele:winat ~ ʔepele:win*. HOP: *pi̓rïkna* 'to unfold, open up, unwrap'. TAK: Ca *péla:n* 'to spread open'. Cp *péle* 'to spread apart'. TRC: Ed *périna* 'to open the hand or a book'. AZT: Pp *pe:lua*.

(3) 'owl'. PUA **tukori. (S-1591). TUB: *tukluluh* 'screech owl'. HOP: *tokori* 'flammulated owl'. TEP: To(M) *cukuɻ* 'screech owl, western horned owl'. Nv *tukuu*. PYp *tukor*. NT *tukúrai*. ST *tukú:r*. TRC: Rr *tutúguri* 'great horned owl'. CRC: Cr(P) *tukurú*. AZT: Na-Cl *tekolo:tl*. Pp *tekulu:t*. Po *tekolot*.

Terms for 'owl' that are clearly related to PUA **tukori are found in non-UA languages spoken in California and across Mesoamerica (Gursky 1967; Hunn 1975; Campbell 1988:343, #38; Kaufman and Justeson 2003). The ultimate origin of this etymon is unknown, but its presence in the PUA lexicon is assumed because cognates in both NUA and SUA languages show the expected sound changes that occurred after the breakup of the ancestral PUA speech community, for example **u > Hp /o/ and **t > To /č/. One exception is the Cora term *tukurú*, possibly a loan from Southern Tepehuan. The expected Cora reflex of *tukori is *tïkuri*.

Set (4) includes cognates from three SUA subfamilies but only one definite NUA cognate,

10. The "V-" indicates that the final vowel of this syllable as well as the following segments of the PUA etymon cannot be reconstructed.

from Kitanemuk.

(4) ‘turkey vulture’. PUA **wiruku. (S-343). TAK: Kt *wirukuht*. TrC: Yq *wiíru*. My *wiíru*. Rr *wirú*. TBR: *wilú*. CRC: Hc *wirïkï*.

The Kitanemuk and Huichol cognates provide one of the more compelling examples of the correspondence of medial /r/ in NUA and SUA languages. These terms show the expected sound correspondences for six segments, given that /ï/ is the Huichol reflex of **u. Possible cognates from the other three NUA subfamilies and Aztecan are presented in Appendix 2: TURKEY VULTURE.

Set (5), also associated with a kind of bird, includes clear cognates in Hopi and the Taracahitan subfamily, with possible cognates in some Numic languages:

(5) ‘a kind of hawk’. PUA **kïri. (S-743). NUM: NP *kiniʔi* ‘marsh hawk’. TSh *kinniʔ* ‘falcon’. WSh-D *kinii* ‘hawk, falcon’. Sh-G *kinniih* ‘chicken hawk’. HOP: *kʸe:le* ‘sparrow hawk’. TRC: My *keréʔere* ‘a raptor (possibly a species of *Caracara*)’. Op *keere* ‘kind of hawk’. Wr *kerecí* ‘small hawk’. Rr *kiričí* ‘small hawk’.

The vowels attested in these terms are not regular correspondences: Numic /*i*/ reflects PUA **i, Mayo and Opata /*e*/ reflects PUA **ï, Rarámuri /*i*/ reflects both **i and **ï, and Hopi /*e*/ reflects all PUA vowels. The Hopi and Taracahitan cognates indicate a reconstruction of PUA **kïrï while the Numic terms support **kiri. I reconstruct the PUA etymon as **kïri, on the assumption that vowel harmonization in opposite directions resulted in these alternate antecedent forms.

The discrepancy in vowels challenges the validity of this set, but the correspondence of Numic *-n-* and *-r-/-l-* in other UA languages is documented in three additional sets, where the vowels correspond as expected. Together these sets include cognates from all three Numic

subdivisions and the other three NUA subfamilies. Set (6) also includes a cognate from the SUA language Warihó.

(6) 'concavity'. PUA **koro. NUM: WSh-D *konoʔih* 'to be hollow'. WSh-G *konoiH* 'to be hollow'. HOP: *qölö* 'hole (in ground)'. TRC: Wr *koláci* 'bowl-like hollow in a rock wall'.

(7) 'to enter'. PNUA *curu. (S-1244). NUM: NP *cunua*. Kw *cununuki-*. TAK: Cp *čúlupe-yaxe* 'to go in'. Ls *čulúpa* 'to go inside'. Kt *curupïk*.

(8) 'to bend'. PNUA *pora. (S-430). NUM: SP *poni ~ ponaa-* 'to bend over'. Kw *noponi* 'to be bent over'. TUB: *poloʔmat ~ poloom* 'to bend (vi)'.

*2.2. PUA **r in Initial Position*

Only Whorf and Trager (1937) and Voegelin, et al. (1962) have proposed that a liquid phoneme occurred in PUA in word-initial position and also presented evidence to support their view, in each case a single cognate set. Whorf and Trager (1937:621, #28) reconstructed PUA **lăwa ~ **lĕw 'speak, say', but the only term showing initial *l-* in the accompanying cognate set is the Hopi noun *lavayi* 'speech, talk'. Voegelin et al. (1962:141, #94) proposed **lïŋi as the PUA term for 'tongue' but, as indicated in (23) below, this etymon should be reconstructed as **nïŋi.

Although a few words with initial *r-* or *l-* are found in the lexica of all of the Uto-Aztecan languages that have these phonemes, they tend to be encountered in single languages or languages within the same subfamily and thus can be interpreted as innovations. When cognates exist in separate subfamilies, they indicate that the *r-* or *l-* likely derived from other consonants, usually *t-* but sometimes *y-* or *n-*, or has shifted from medial to initial position through metathesis or the loss of a preceding syllable. In fact, the only evidence that word-initial *r-* or *l-* should be reconstructed for PUA is three sets with cognates from the Cupan languages of the

Takic subfamily and Yaqui and Mayo of the Taracahitan subfamily. Set (9) has cognates in all three Cupan languages and Yaqui but not Mayo. Set (10) has cognates from Luiseño and Mayo and possibly Cahuilla but not Yaqui or Cupeño. Set (11) has only Luiseño and Mayo cognates.

(9) 'bumpy'. (S-1405). TAK: Ca *lúmu* 'to have small pox, chicken pox, measles'. Cp *lúmiʔilʸ* 'measles'. Ls *lamúlama* 'to have bumps, have sprouts'. TRC: Yq *rumui* 'bumpy'. Yq-Az *rumui* 'uneven'.

(10) 'collapse'. TAK: Ca *lúmaš* [expected: *lémaš*] 'to knock down, crumple (as a house)'. Ls *lóma* [< *lïm-] 'to collapse (vi)'. TRC: My *rémtek* [< *rïm-] 'to collapse (vi)'

(11) 'to be soft, tender (adj)'. TAK: Ls *lé:pa* [< *ló:p-] 'to be soft'. TRC: My *loóbo* 'tender (adj)'

The Luiseño and Mayo cognates in (10) and (11) are particularly intriguing because the correspondences conform precisely to the expected, including even vowel length in (11). Moreover, the cognates involved cannot be interpreted as recent loans because the first vowels reflect the shifts that occurred from PUA **o to Ls /*e*/ and from PUA **ï to Ls /*o*/ and My /*e*/. The timing of these innovations is unknown, but in the case of Luiseño, they would have taken place after its separation from Cahuilla and Cupeño. Although shifts in PUA **o and **ï also occurred Cahuilla and Cupeño, the outcomes were different from those in Luiseño: **o shifted to /*i*/ in both Cahuilla and Cupeño while **ï shifted to /*e*/ in Cahuilla and /ə/ in Cupeño (represented as <e> in Hill and Nolasques [1973]). The shift of **ï to Mayo /*e*/ also is likely to have occurred relatively early in the history of the SUA languages because it is an innovation shared by all SUA languages except those of the Tepiman subfamily (Hill 2011).

The PUA forms **ramu, **rïm-, **roop- could be reconstructed on the basis of these three sets, which in turn would support the reconstruction of PUA initial **r-. While this possibility

cannot be discounted entirely, it seems unlikely given the absence of cognates for any of these sets in other UA subfamilies, as well as additional sets with cognates from both NUA and SUA subfamilies that show an initial liquid. An alternative explanation is that these cognates derive from interaction between pre-Cupan and pre-Yaqui-Mayo speakers that took place before the shifts in the vowels occurred.

2.3. Discussion

If the four cognate sets associated with birds are excluded, the postulation of **r as a PUA phoneme is nonetheless possible based on the regular correspondence of medial *-r/l-* in the NUA and SUA cognates in the other six sets. In contrast, the limited distribution of cognates in the few sets that document the correspondence of initial *r-* or *l-* indicate that this phoneme can be reconstructed with confidence only in non-initial position, suggesting that it was defective.

The onomatopoetic origin of the avian terms in (3), (4), and (5) is a possibility, but except as noted for (5), they display the sound correspondences that are expected for reflexes of PUA etyma and should be regarded as cognates.[11] The regular correspondences and broad distribution of several of these cognates within the UA language family may indicate that members of the PUA speech community relied on onomatopoeia to create names for birds and that portions of the ancestral PUA ornithological lexicon descended into the lexica of the daughter languages. Alternative explanations are less feasible, for example, that names for birds diffused more widely than nouns in other semantic classes or that the labels were independent innovatations in different UA subfamilies created in each case prior to sound changes that distinguish the subfamilies from one another.

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11. The Western Mono suffix -naʔ ‘it says X’ is attached to onomatopoetic stems to create names for birds and other animate beings (Bethel, et al. 1993:102) (see Appendix 2: BIRD).

The conclusion that PUA **/r/ had **[r] and **[l] as its allophones is warranted, based on three considerations: /*r*/ and /*l*/ regularly correspond in both the NUA and SUA languages; [r] and [l] are allophones of /*r*/ or /*l*/ in the Taracahitan and Tubar subfamilies and probably in proto-Tepiman as well, and allophonic-like relationships between /*r*/ and /*l*/ are attested in Hopi, Luiseño, Mayo, and Yaqui. Additional support for this interpretation is found in the absence of a fixed correspondence between *-r-* and *-l-* in Hopi and Luiseño cognates. Four pairs of cognates illustrate this point:

(12) Hp *-l-* = Ls *-l-*. Hp *ŋöla* [< *ŋola] 'hoop, ring (n)'. Ls *ŋé:la* [< *ŋo:la] 'to be turned, be curved'

(13) Hp *-r-* = Ls *-r-*. Hp *mïrï(k)* 'to curl around, twist around (vi)'. Ls *móra* [< *mïra] 'to be curled, be rolled'

(14) Hp *-l-* = Ls *-r-*. Hp *qalalata* 'to be clanking, clinking, ringing'. Ls(B) *kára* 'to croak, belch, ring'

(15) Hp *-r-* = Ls *-l-*. Hp *ŋïri* 'to gnaw (re rodents)'. Ls *ŋó:la* [< *ŋï:la]'to gnaw'

Medial *-n-* can be proposed as the Numic reflex of PUA **-r- because *-n-* in words from all three Numic subdivisions corresponds with *-r-*/*-l-* in other UA languages. Although limited, this evidence suggests that PNUA *-r- shifted in Proto-Numic (PNum) to *-n-, merging with a pre-existing PNum *-n- derived from PNUA *-n-. Postulating this sound change accounts for the anomalous absence of a liquid phoneme in the Numic languages and, if it in fact occurred, represents a phonological innovation shared by the Numic languages that has not been previously identified (Hill 2011).

3. The Correspondence of NUA *-n-* and SUA *-r-/-l-*

Recognition of the regular correspondence of *-n-* in the NUA languages with *-r-*/*-l-* in the SUA

languages dates to Sapir's pioneering studies in Uto-Aztecan comparative linguistics of the early twentieth century, and this correspondence is generally accepted among Uto-Aztecanists today (Sapir1915:316-317; Shaul 1985; Dakin 2001; Dakin 2007; Stubbs 2011:26). Twelve cognate sets that clearly document correspondence. Five sets are presented here, all of which have cognates from at least two NUA subfamilies and two SUA subfamilies. The other seven appear in Appendix 2 under CHILD, FOOT, GENTLE, NECKLACE, PITCH, POUR, and SMALL.[12]

3.1. Cognate Sets

Between (16) and (17), the regular correspondence of NUA *-n-* and SUA *-r-/-l-* is demonstrated for all nine UA subfamilies.

(16) 'to stand'. PUA **wïnï. (S-2158). NUM: NP *wïnï*. WMn *wïnï*. TSh *wïnï*. WSh-D *wïnï*. WSh-G *wïnï*. Cm *wïnï*. Kw *wïnï*. SP *wïnï*. SUt *wïnïwi*. TUB: *wïnït* ~ *ʔïwïn* 'to be located, to exist'. *ï:wïnït* ~ *ï:*ʔï:wïn and *ʔï:wïn* 'to stand up'. HOP: *wïnït*. TAK: Ca *wéwen*. Ls *wón* 'to be at a place'. TRC: Yq *weyek*. My *wéiyek*. Ed *vehren*. Wr *werí*. Rr *wirí*. TBR: *weré* 'to be, to be standing'.

(17) 'to know, recognize, remember, think'[13]. PUA **ïʔna. (S-2284). HOP: *iʔna*. TAK: Ca *eʔnan*. Ls *óʔna*. Kt *ïn*. TEP: To *ïlið*. NT *ïlídïï*. ST *ïlʲíidʲ*. TRC: Yq *ea.* My *eiya*. Ed *erám*. Wr *eʔláni*. CRC: Hc *érie*. AZT: Na-Cl *ilna:miki*. Pp *elna:miki*.

These two sets illustrate the loss of intervocalic *-r-/-l-* in bothYaqui and Mayo, which occurs more frequently in Yaqui than in Mayo (Dedrick and Casad 1999:30; Dakin 2001:328-331;

12. Langacker (1977:146; cf. Dakin 2001:328-333) suggests that the correspondence of NUA /*n*/ and SUA /*l*/ in suffixes may be found in the NUA causative suffix *-ni and the initial element of the SUA applicative suffix *-li-ya.

13. The glosses associated with each of these cognates are presented in Appendix 2 under THINK.

Stubbs 2011:29). In some cases, *-y-* is inserted to eliminate the resulting vowel cluster, as seen in the Yaqui and Mayo cognates in (16) and the Mayo cognate in (17). The loss of the intervocalic liquid without y-insertion is documented in the Yaqui cognate in (17) and in the Yaqui and Mayo reflexes of PUA **konaka 'necklace' (Appendix 2: NECKLACE).

The retention of *-r/l-* in Yaqui and Mayo is seen in (18) to (20). Combined they include cognates from all nine UA subfamilies. Set (18) shows the expected shift of **s to /*h*/ in Kitanemuk and the Tepiman languages, with the *h-* lost in the Northern Tepehuan cognate. Set (19) includes examples of the loss of initial **h- in cognates in Southern Paiute, Southern Ute, Tubatulabal, and Huichol and the shift of **/u/ to /*ï*/ in the Southern Paiute and Huichol cognates. Both phonological changes are regular developments in Huichol and also are encountered in some reflexes of PUA etyma attested in many other UA languages.

(18) 'heart'. PUA **suna. (S-1165). Tub: *su:nal*. Hop: *so:na* 'kernel, edible part of any seed'. TAK: Ca *súnil*. Cp *şúun*. Ls *şúnla*. Kt *hunac*, 'heart, spirit, middle'. TEP: Nv *huradi*. NT *ura*. ST *húr*. TRC: My *suúla*. Ed *surát* 'kernel, seed'. Wr *sulá*. Rr *surá*. TBR: *suranyi* 'with the heart'.

(19) 'badger'. PUA **huʔna. (S-107). NUM: NP *hunana*. TSh *hunan ~ hunacci*. Sh *hunan*. Cm *huunaʔ* 'groundhog, woodchuck'. Kw *hunaci*. SP *ïnámpïci*. Ch *huna*. SUt *unáppüci*. TUB: *u:nal* 'black bear'. HOP: *honani*. Hp *ho:naw* 'bear'. TAK: Ca *húnal*. Cp *húnwet* 'bear'. Cp *húnal*. Ca *húnwet* 'bear' Ls *hú:nal*. Kt *hunavït*. Kt *hunawït* 'grizzly bear'. TRC: Yq *huúri*. My *huúri*. Ed *húrve* 'wolf'. Wr *uʔlá* 'skunk'. CRC: Cr ïïraʔabe. Hc *ïrve* 'wolf'

Set (19) offers interesting examples of the semantic shifts that have occurred in many PUA etyma that label biological taxa. The cognates indicate that **huʔna originally designated

'badger' but came to label 'black bear' in Tubatulabal and 'skunk' in Warihó.[14] A term for 'bear' in Hopi, Cahuilla, Cupeño, and Kitanemuk was derived from *huʔna by the addition of the PUA augmentative suffix **wï, reflexes of which constitute the final syllables of the Eudeve, Cora, and Huichol labels for 'wolf'.

(20) 'house'. PUA **kahani. (S-1213). NUM: TSh *kahni*. WSh-D *kahni*. WSh-G *kahni*. Cm *kahni*. Kw *kahni*. SP *kanní*. Ch *kaní* SUt *káni*. TUB: *hani:l*. HOP: *qeni* 'place, room, space'. TRC: Yq *kári*. My *káari*. Wr *karí*. Rr *karí*. TBR: *kałín* 'village'. AZT: Na-Cl *kalli*. Pp *kal*.

The reconstruction of **kahani is indicated by the stress on the first vowel of the identical vowel sequence in the Mayo cognate and the *-hn-* cluster in the Central Numic languages and Southern Numic Kawaiisu. Tubatulabal *h-* and Hopi *q-* are the regular reflexes of PUA **k- in this environment. Hopi /*e*/ is encountered as a reflex of all PUA vowels.

*3.2. Initial **n-*

In contrast to the postulated PUA **r, PUA **n- definitely can be reconstructed in word-initial position. Sets (21) to (23) support the reconstruction of **n- preceding **a and **ï and probably **o, but I have be unable to identify cognates from both the NUA and SUA languages that indicate that PUA **n- also occurred before **i and **u.

(21) 'ear'. PUA **naka. (S-752). NUM: NP *naka-*. WMn *náqa*. WSh-G *nainkih*. Cm *naki*. TSh *naŋki*. Kw *nagavivi*. SP *nanka-*. TUB: *naŋhal*. HOP: *naqvï*. TAK: Ca *náqal*. Cp -

14. Jane Hill discovered that C. Hart Merriam collected a Tubatulabal term for 'badger', which is found in his unpublished "Natural History Word Lists" (BNEG1556:60, frame 483) available online at www.archives.org/details/bancroft. Merriam recorded the alternate forms "Ben′-ně′ | Pen′-ně." Whether this term is a Tubatulabal innovation or a loan from a non-UA lanaguage is unknown (Jane Hill, personal communication, 2011).

naqʔa. Ls -*naq*. TEP: To *naak*. Nv *naka*. PYp *naaka*. NT *naáka*. ST *náak*. TRC: Yq *nákam*. My *nákkam*. Wr *nahká*. Rr *naká*. TBR: *naká-r*. CRC: Cr *nasaíh*. Hc *naaká*. AZT: Na-Cl *nakastli*. Pp -*nakas*.

(22) 'liver'. PUA **nïma. (S-1366). NUM: NP *nïmï*. WMn *nïwï*. WSh-G *nïwïn*. Cm *niïmï*. TSh *nïmï*. Kw *nïwïbi ~ nïwïmbi*. SP *niŋwïmpi*. TUB: *niïmal*. HOP: *niïma*. TAK: Ca -*némʔa*. Cp -*nema*. Ls -*nó:ma*. Kt *nïmac*. TEP: To *nïm*. Nv *numadi*. PYp *nïmar*. NT -*nï̃ma ~ nïmádï*. ST -*lumáad*. TRC: Yq *heéman*. My *heémam*. Ed *hemát*. Wr *emá*. Rr *emará ~ imará*. TBR: *yamát*. CRC: Cr *neemwa*. Hc *néma*.

(23) 'egg'. PUA **no-. (S-804). NUM: NP *noho-*. WMn *nóyo*. WSh-G *noyo*. Cm *nooyo*. TSh *noyopin*. Kw *nopavi ~ nopovi*. Ch *nopávi*. SUt *napáavi*. HOP: *nóhï*. TEP: To *nonha*. Nv *nono*. NT -*nóno*. ST *nanóoo*.

The loss or replacement of initial *n*- in some of the SUA languages in (22) is unexplained. However, their retention of initial *n*- before **ï is seen their reflexes of **nïŋi 'tongue' (27), with the exception of Warihó, where *y*- appears instead of *n*-. The SUA languages are represented in (23) only by Tepiman cognates, but the regular correspondences indicates that it is a valid set.

3.3. Discussion

The evidence presented in this section and in section 2 above demonstrates that -*r*-/-*l*- is the regular SUA correspondence of both NUA -*n*- and -*r*-/-*l*-. This pattern suggests that PUA medial **-n- descended into PSUA as *-n- and then, before the breakup of the PSUA speech community, merged with a pre-existing PSUA *-r- that derived from PUA **-r- and retained its allophones of **[-r-] and **[-l-]. During the subsequent diversification of the SUA languages, three distinct secondary developments occurred:

- [-r-] and [-l-] remained as allophones in Warihó, Rarámuri, and Tubar;
- [-r-] and [-l-] merged under /*r*/ in Eudeve and under /*l*/ in the Aztecan languages; and
- [-r-] and [-l-] were phonemicized in Yaqui, Mayo, and the Tepiman languages.

According to my analysis, the shift of PSUA *-n- to *-r- set the stage for a second SUA phonological innovation, the shift of PUA **-ŋ- to PSUA *-n-, as part of a pull-chain process of phonological change. The evidence for this innovation is considered in the next section.

4. The correspondence of NUA /ŋ/ and SUA /*n*/

The Northern Uto-Aztecan languages are among the very few Indigenous languages of North America that include the velar nasal /ŋ/ in their phonemic inventories (Anderson 2011; Whistler and Golla 1986). In Hopi and the Takic languages, /ŋ/ is encountered in both initial and medial positions while in Tubatulabal and the Numic languages, it is attested only medially. Phonemic /ŋ/ is entirely absent in the Southern Uto-Aztecan languages, but several cognate sets indicate a regular correspondence between SUA /*n*/ and NUA /ŋ/.

4.1. The Velar Nasal in Medial Position

Eight sets document the regular correspondence of NUA -ŋ- and SUA -*n*-. Four sets are included in Appendix 2 under CONTAIN, HUSBAND, LUNG(S), and PULVERIZE. The other four, which have cognates from at least two NUA and two SUA subfamilies, are presented here. These sets indicate that medial *-ŋ- must be reconstructed for Proto-Northern Uto-Aztecan. They also document the diversity of Numic reflexes of PNUA *-ŋ-, discussed in more detail in section 4.2.

(24) . PUA **oŋa. (S-1865). NUM: NP *oŋabi*. WMn *omábi*. TSh *oŋwapi*. WSh-D *ohapin*. WSh-G *onapin*. Cm *onaabi*. Kw *owavi*. SP *oavi*. SUt *öávi*. TUB: *uŋa:l*. HOP: *ö:ŋa*. TAK: Ca *íŋiˡʸ*. Cp *íŋeyu* ‘to salt’. Ls *éŋla*. TEP: Nv *ona*. PYp *ona*. NT *onai*. TRC: Yq

oóna. My *oóna*. Ed *onát*. Wr *woná*. Rr *oná ~ koná ~ noná*. TBR: *onát*. CRC: Cr *unáh*. Hc *úna*.

(25) ‘knee’. PUA **toŋa. (S-941). NUM: NP *taŋapisa ~ taʔŋapisa* ‘kneecap’. WMn *tonobódo ~ tanobódo ~ tanabódo*. TSh *taŋappïh*. WSh-G *tankappïh ~ tannappïh*. Cm *tana*. Kw *tanavï*. SP *taŋavi*. Ch *taŋa*. SUt *táavi*. TUB: *toŋo:l*. TEP: To *toon*. Nv *tona*. PYp *toni*. NT *toona*. ST *toon*. TRC: Yq *tonom*. My *tónnom*. Ed *tonót*. Wr *tonó* ‘foot’. Rr *ŕonó* ‘foot, leg’. TBR: *tonor*. CRC: Cr *tunú*. Hc *tunú*.

(26) ‘hot, hot season, sun’. PUA **toŋV-. (S-1207). HOP: *tö:ŋi*, ‘heat, hot weather, heat of the day’. TAK: Ca *tíŋiš* ‘warm’. Cp *tíŋe* ‘to be hot’. Kt *toŋavaʔ ~ tuŋavaʔ* ‘hot season’. TEP: Nv *tonoŗo* ‘for the sun to shine’. PYp *tono* ‘hot’. NT *tonóli* ‘sunshine’. NT *tóñi* ‘hot’. TRC: Ed *tonó* ‘to be hot, to boil’. Wr *tono ~ toni* ‘to boil’. Rr *ŕonó* ‘to boil, to ferment’. TBR: *tonó* ‘to be hot’. AZT: Na-Cl *to:na* ‘to be warm, for the sun to shine’. Pp *tu:nal* ‘sun’. Po *tunél* ‘sun’.

(27) ‘tongue’. PUA **nïŋi. (S-2364). HOP: *leŋi*. TAK: Ca *náŋilʸ*. Cp *neŋʔa*. Kt *nïŋič*. TEP: To *nïïni*. PYp *neeni*. NT *nïïni*. ST *nïïn*. TRC: Yq *níni*. My *ninni*. Ed *nenét*. Wr *yení*. TBR: *ninír*. AZT: Na-Cl *nenepilli*. Pp *nenepil*.

Despite showing initial *l*-, Hp *leŋi* is assumed to belong in (27) because the other three segments show the expected correspondences. The Warihó cognate also has an aberrant initial consonant, and /*e*/ rather than /*a*/ is the first vowel expected for the Cahuilla cognate.

4.2. Numic Reflexes of *-ŋ-

The Numic subfamily is divided into three subdivisions (see Table 1): 1) Western Numic, with Northern Paiute and Mono as its constituent languages, 2) Central Numic, which includes Timbisha Shoshone, Shoshone, and Comanche, and 3) Southern Numic, comprising Kawaiisu,

Southern Paiute, Chemehuevi, and Ute, the last three representing dialects of a single language that Miller, et al. (2005:414) label Colorado River Numic. Medial -ŋ- is attested in at least one language in each of the three subdivisions, indicating that PNUA *-ŋ- descended into Proto-Numic (PNum) and subsequently into the ancestral languages of these subdivisions. However, following the emergence of these subdivisions, medial *-ŋ- underwent a series of secondary developments in which it shifted in most of the daughter languages to other consonants or was lost entirely.

The attested reflexes of PNum intervocalic *-ŋ- in the modern Numic languages are presented in Table 4.[15] Words that reflect only seven etyma are considered, and cognates are not attested in all the Numic languages for four of them. In addition, cognate sets cannot be compiled in which -ŋ- is attested in all intervocalic contexts. Five vowels are reconstructed for PNumic: */a, i, ï, o, u/ (Babel, et al., n.d.: 9-10). The cognate sets represented in Table 4 document the reflexes of PNum *-ŋ- following */a, ï, o, u/ and preceding */a, i, o/, but not following */i/ or preceding */ï/ or */u/. Despite these problems, these seven cognate sets represent the best data I have found for documenting and analyzing the Numic reflexes of *-ŋ-.

[Insert Table 4 about here]

The diversity of these reflexes are too complex to be discussed in detail here, but the principal secondary developments involving *-ŋ- can be summarized as follows:

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15. The words in which these reflexes occur are included in Appendix 2 under the referents given in table 4. The reconstructed etyma are Proto-Numic. The etyma for 'knee', 'salt', and 'lung(s)' are reflexes of PUA etyma, while cognates for the remaining four words are attested only in Numic languages. In Table 4, a zero indicates the loss of -ŋ-. A double dash indicates that the term attested in a particular language for the concept in question is not cognate with the other Numic terms in the set. A single dash indicates that no term for the concept was encountered in the sources consulted.

- **Western Numic:** 1) -ŋ- is retained in Northern Paiute and probably Eastern Mono in all contexts; 2) in Western Mono -ŋ- shifted to -*n*- except in the enviroment of /*o_a*/, where it shifted to -*m*-.[16]
- **Central Numic:** 1) -ŋ- is retained in Timbisha Shoshone, being labialized as [ŋ^{w}] following round vowels; 2) PNum *-ŋ- is doubly reflected in Western Shoshone as -*nk*- and -*nn*-, which seem to be in free variation, except in the context /*o_a*/, where -*nk*-, -*n*-, and -*h*- are attested in different variants; 3) in Eastern Shoshone, -*nk*- and -*n*- are attested as alternate reflexes of *-ŋ-; 4) in Northern Shoshone, the alternate reflexes are -*nn*- and -*n*- except in the environment of /*o_o*/, where the reflex is -*w*-; 5) in Comanche, -*m*- is the reflex of *-ŋ- in the context /*o_o*/ and -*n*- in all other attested environments.[17]
- **Southern Numic:** 1) -ŋ- apparently is retained in Southern Paiute and Chemehuevi in the context of non-round vowels and lost following /*o*/, although its loss is attested in Southern Paiute both following /*o*/ and in the context of /*ï_a*/; 2) in Kawaiisu, -ŋ- also is lost following /*o*/, shifting to /*-n-*/ following /*a*/; 3) in Southern Ute, -ŋ- is lost in all environments.

The Numic languages display a general trend toward the loss of the velar nasal as a phoneme. The first step in this process likely occurred in Proto-Numic with a shift of *ŋ- to *n- in morpheme-initial position, a sound change discussed in section 4.3. Subsequent secondary

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16. I use "Eastern Mono" and "Western Mono" here simply for convenience. Babel, et al., n.d., provide the best overview of the dialectical diversity within the Western Numic subdivision. They argue that Proto-Mono never existed, proposing instead that both "Mono" and "Northern Paiute" descend directly from Proto-Western Numic.

17. Miller, et al. (2005:439, n. 34) suggest that the shift of Proto-Central Numic (PCN) *-ŋ- to Common Shoshone/Comanche -*nk*- ~ -*nn*- was "not very tidy" and that "the reflexes of PCN *ŋ were still in a state of flux during the late Common Shoshone/Comanche period."

developments in languages from all three Numic subdivisions resulted in the retention of medial -ŋ- only in Northern Paiute, Eastern Mono, Timbisha Shoshone, and the Southern Paiute and Chemehuevi variants of Colorado River Numic. However, as seen in (28) and (29), there is some indication that a shift from -ŋ- to -*n*- was underway in Northern Paiute, Southern Paiute, and Chemehuevi as well. Set (28) shows a correspondence of -ŋ- in Timbisha Shoshone and Chemehuevi with -*n*- in Northern and Southern Paiute, while (29) shows a correspondence of -ŋ- in Timbisha Shoshone and Northern Paiute with -*n*- in Southern Paiute and Chemehuevi.[18]

(28) 'younger sibling, youngest'. PNum *piŋa. (S-2001). NP *pinagi* 'younger sibling'. TSh(M) *piŋŋa* 'youngest sibling'. SP *pinnappïci* 'youngest, last'. Ch *piŋatïm* 'youngest'.

(29) 'to tell'. PNum *tïnV-. (S-1877). NP-Y *tïïŋï* 'to tell to'. TSh *tïŋa* 'to tell to'. SP(S) *tïnnia*. Ch *tïnia* 'to tell'.

A comparable shift may also have been taking place in some variants of Western Shoshone, in the -*nn*- ~ -*nk*- reflex of *-ŋ-.

(30) 'high, up'. PNum *paŋa. (S-77). NP *paŋaadï* 'high'. TSh *paŋe* [< **paŋai*] 'up'. WSh-B *pankai ~ panai ~ pan ~ paʔai* 'up, high, above'. WSh-D *panai* 'up, upwards'. WSh-G *panai* ~ paʔa 'up, high'. WSh-R *panki* 'up, high'.

The cognate in the Ruby Valley (WSh-R) variant of Western Shoshone shows -*nk*-, as does one of the alternate forms in the Big Smokey Valley variant (WSh-B). The other Big Smokey Valley forms show -*n*- or -ʔ-, also seen in the Duck Valley and Gosiute variants (WSh-D, WSh-G). The following sequence of sound changes in the Western Shoshone variants can be proposed: *paŋai

18. The nasals in the words presented in (28) vary between plain and lengthened (geminated), but differences in consonantal length does not preclude the correspondences from being regular. Based on research in progress, I interpret the geminates in TSh *piŋŋa* and SP *pinnappïci* as synchronic vestiges of antecedent unstressed syllable coda.

> *pankai ~ pannai > panai > pan ~ paʔai ~ paʔa*.

4.3. The Velar Nasal in Initial Position

I have identified four sets in which Hopi or Takic terms with initial ŋ- have cognates in languages that belong to other UA subfamilies. Three of these sets include cognates from at least two SUA languages. An additional three sets have cognates from Hopi and the Takic languages alone. Taken as a whole, these sets indicate a regular correspondence between initial ŋ- in Hopi and Takic and initial *n*- in all the other UA subfamilies.

This correspondence is most clearly seen in (31), in which initial ŋ- in Hopi and Luiseño corresponds with initial *n*- in Tubatulabal and the Tepiman, Taracahitan, Corachol, and Aztecan subfamilies.[19] This set lacks cognates from Tubar and the Numic languages. A Tubar cognate exists for (32), but I have found no Numic words that are unquestionably cognate with terms in Hopi or the Takic languages that show the initial velar nasal. However, (32) and (33) suggest that, as in Tubatulabal and the SUA subfamilies, initial *n*- in the Numic languages corresponds with initial ŋ- in Hopi and Takic.[20]

(31) 'to bend, curve, turn, return'. PUA **ŋora. (S-455). TUB: *noʔlat ~ ʔono:l* 'to go home'. HOP: ŋ*ölöla* 'to bend, to crook'. TAK: Ls ŋ*é:la* 'to be turned, be curved'. TEP: PYp *norag* 'to return'. NT *norági*- 'to go back'. TRC: Ed *norón* 'to go back, come back'. Wr *noʔláni ~ noʔáni* 'to go someplace and return'. Rr *norína* 'to come back'.AZT: Na-Cl(M) *noloa* 'to bend (vt)'. Na-Cl(M) *noliwi* 'to become bent'.

19. Not all cognates are included in (31). The completed set is presented in (1).

20. No Southern Numic cognates exist for any of these sets, but Kawaiisu *nohopï* 'to unravel' may be cognate with Hopi ŋ*a:ha* 'to unravel, untie'. If so, the reconstruction of PNUA *ŋoha- is indicated, with vowel harmonization occurring in both languages but in opposite directions.

(32) ‘root’. PUA **ŋa-. (S-1832). NUM: WSh-G *nappïh* ‘edible part of the cattail between the stem and the root’. HOP: ŋ*a*-. TAK: Kt ŋ*akawi*. TRC: Yq *naáwa*. My *naágwam*. Ed *náva*. Wr *nawá*. Rr *nawá*. TBR: *namusír*. CRC: Cr(O) *nanat* ‘tree root’. Hc *naná* ‘tendril, kinds of climbing vines’. AZT: Na-Cl *nelwatl*. Pp *nelwat*.

(33) ‘to cry’. PUA *ŋa-. (S-607, S-608, S-609). NUM: TSh *namoʔi* ‘to cry, make noise (of animals)’. WSh-G *nawoih*. Cm *nawooʔi*. TUB: ʔ*ana*ŋ*at* ~ ʔ*ana*ŋ || Tb *ana*ŋ- ~ *na*ŋ- (Voegelin 1935:169). TAK: Ca ŋ*áŋ*. Cp ŋ*a*ŋ*a*. Ls ŋ*áa*ŋ*i* ‘to cry about someone or something’. TRC: Op *narak*. Wr *naláni*. Rr *narán*.

The Numic terms in (33) come from languages that belong to the Central subdivision of the subfamily, and all are the non-singular suppletive forms of the verb ‘to cry’, which can be reconstructed for Proto-Numic as *yaka (Stubbs 2011: #610). The initial syllable *na*- may be cognate with the ŋ*a*- in the Takic languages, while the following two syllables in the Numic forms may be a separate morpheme related to terms in these Numic languages for ‘bark’ or ‘howl’: TSh *wohi*, WSh-G *woʔai*, Cm *woorï* . The proposed cognates from other languages in (32) and (33) also show the expected correspondences only for the initial syllable *ŋa-, suggesting considerable reinterpretation of the etyma from which they presumably derived.

An additional cognate set that is relevant to analyzing the velar nasal in PUA involves a locative morpheme that is encountered throughout the UA language family as a bound or unbound postposition. It shows the same correspondences of initial ŋ- and *n*- seen in word-initial position.

(34) [Locative postposition]. PUA **ŋa-. (S-1980). NUM: NP(T) -*na* ‘from, out from’ (Thornes 2003: 229). NP -*nakwa* ‘side’. NP -*nakwaana* ‘from direction’. TSh -*na*ŋ*kwa* ‘in the direction of, beside’. Cm -*nakwï* ‘side, direction’. SP -*na*ŋ*kwa*

‘direction’. HOP: -ŋ*aqw* ‘from, away from, inside of’. TAK: Ca *má*-ŋ*ax* ‘on or by the side of, near’. Cp -ŋ*a* ‘in, in the way that’. Cp -ŋ*ax* ‘from, because of’. Cp -ŋ*aʔaw* ‘on, on top of’. Ls -ŋ*a* ‘in, inside, about, by, on, at, to’. Kt -ŋ*a*[21]. TRC: Yq-Az -*napo* ‘near’. Wr -*na* ~ -*ena* ‘on this side, closer’. Rr -*na* ‘towards’ [*aki-ná* ‘towards here’, *wami-ná* ‘towards there’]. TBR: -*ná* ‘towards’. CRC: Cr =*na* [an enclitic that marks a particular point in space or time (Casad 1977:229-230)]. Hc -*na* [bound locative postposition: *é-na* ‘here’, *má-na* ‘there’]. AZT: Na-Cl -*nal* ‘across, through, to the other side’.

A shift of *ŋ- to *n*- in Numic postpositions is suggested by the retention of /ŋ/ in the morpheme -ŋ*a*- when it occurs in independent words, for example, NP *paŋaadï* ‘high’ and TSh *paŋe* [< *paŋai] ‘up’, both of which are cognate with the Tubatulabal locative *paaŋa* ‘up; above’.

The final three sets presented in this section have cognates only in Hopi and some Takic languages.

(35) ‘to coil’. PNUA *ŋawi. (S-457). HOP: ŋ*awi* ‘coil, skein, strand (n)’. Hp ŋ*awita* ‘to be coiling, be making into strands, skeins’. TAK: Cp ŋ*áwe* ‘to coil, as rope’. Ls ŋ*áwi* ‘to coil, tangle’.

(36) ‘to sway’. PNUA *ŋaya. (S-1936). HOP: ŋ*ayàmti* ‘shift, sway, rock (one movement)’. TAK: Ca ŋ*áya* ‘to shake head’. Cp ŋ*áye* ‘to shake head’. Ls(B) ŋ*áya* ‘to be winnowed with a rotary movement’

(37) ‘to gnaw’. PNUA *ŋïri. HOP: Hp ŋ*ïrita* ‘to be gnawing’. TAK: Ls ŋ*ó:li* [< *ŋï:li] ‘to

21. Anderton (1988:436) does not gloss Kt -ŋ*a*, simply noting that it is a “locative suffix used in placenames and ‘left’ and ‘right’.” She (1988:146) suggests, following Harrington, that it may be a loan from other Takic languages, specifically Gabrielino or Fernandeño.

gnaw’

[Insert Table 5 about here]

4.4. Discussion

The regular correspondence in medial position of NUA -ŋ- and SUA -*n*- is documented in eight cognate sets that, when combined, include cognates from all the UA subfamilies (see Table 5). These sets, together with those considered in sections 2 and 3, support the reconstruction of medial *-ŋ-, *-n-, and *-r- for Proto-Northern Uto-Aztecan but only medial *-n- and *-r- for Proto-Southern Uto-Aztecan (see Table 6).

[Insert Table 6 about here]

The most likely source of PNUA medial *-ŋ- is PUA *-ŋ-, but Hill (2011) favors an alternative source. She supports a perspective suggested to her by Manaster Ramer: that PNUA *-ŋ- derives from PUA **-n-, with PNUA *-n- deriving from PUA **-r-, which she represents as **-l/r-. However, PNUA *-n- could not reflect PUA *-r- because of the regular correspondence of -r/l- in both SUA languages and all NUA languages except Numic (see section 2). With PUA **-r/l- eliminated as the source for PNUA *-n-, PNUA *-n- would derive from PUA *-n-, given the regular correspondence of -n- :: -n- in all the NUA languages [see sets (16) to (20) in section 3.1].[22] It is improbable that PUA **-n- is doubly reflected in PNUA because PNUA *-n- and *-ŋ- occur in overlapping intervocalic contexts. In Table 7, I present all the etyma that can definitely be reconstructed for PNUA in which PNUA intervocalic *-ŋ- and *-n- appear. The table shows that both *-ŋ- and *-n- can be reconstructed following *a, *ï, *o,

22. PNUA *-ŋ- obviously cannot be interpreted as a PNUA innovation. It is attested in NUA words with clear cognates in the SUA languages, which document the regular correspondence of NUA -ŋ- :: SUA -n- (see section 4.1).

and *u and preceding *a, *i. Neither can be reconstructed before *u. The only difference in their intervocalic distribution is that *-n- cannot be reconstructed following /i/ or preceding /o/ and *ŋ- cannot be reconstructed preceding /ï/.

[Insert Table 7 about here]

The evidence that the velar nasal occurred in initial position in PNUA is far less robust than that indicating its occurrence in medial position: initial ŋ- is attested only in Hopi and the Takic languages and only preceding reflexes of *a (32-36), *ï (37), *o (31). Nonetheless, the reconstruction of PNUA initial *ŋ- seems to be necessary because no other source for initial ŋ- in Hopi and Takic exists. A shift of PNUA initial *n- to Hopi and Takic initial -ŋ is precluded by the fact that they occur in the same contexts (Kaufman and Justeson 2009: 225; see section 3.2). In fact, both initial *n- and *ŋ- can be reconstucted before *a, ï, and *o and neither can be reconstructed before *i or *u [see sets (21) to (23) and sets (31) to (33)].

The most likely scenario is that the velar nasal occurred in initial and medial position in both PUA, PNUA and early PSUA, being retained in both positions in Hopi and the Takic languages, in medial position only in Tubatulabal and the Numic languages, and in neither position in PSUA. The geographical proximity of Tubatulabal and Numic speakers raises the possibility that the shift of PNUA initial *ŋ- to n- was an areal phenomenon. The same shift in PSUA is best interpreted as a parallel but independent innovation that involved the merging of PUA **ŋ with PSUA *n in all contexts.

5. Counterevidence

By my analysis, all attestations of medial -*n*- in SUA reflexes of PUA etyma languages should derive from PUA **-ŋ-. The principal challenge to this perspective is presented by a few cases in which cognates in both NUA and SUA languages show -n- (Dakin 2001:325; Dakin 2007:298;

Stubbs 2011:20-24).

Stubbs (2011:24, passim) has noted the possible correspondence of NUA *-n-* and SUA *-n-* in several cognate sets, which I have analyzed to determine if an explanation for them can be provided. Sets in which the NUA terms come exclusively from Numic languages in which *-ŋ-* shifted to *-n-* can be eliminated because they could represent the correspondence of NUA *-ŋ-* and SUA *-n-*, for example, Kawaiisu *tiʔniya* 'to trap' and Southern Tepehuan *tiiʔñja* 'to set a trap' (Stubbs 2011:#2407) (see section 4.2). Also excluded for the same reason are sets that involve postpositions in Tubatulabal and the Numic languages (see set 34 above). Six examples remain that cannot be as easily dismissed.

For two of these sets, a single explanation can be proposed for the apparent correspondence of NUA *-n-* and SUA *-n-*: the medial *-n-* actually represents an initial *n-* in a morpheme that is preceded by a monosyllabic root, in which case the regular correspondence of NUA *n-* and SUA *n-* is encountered (Kaufman 1981:162-163).

(38a) 'son-in-law'.[23] (S-2085). NUM: WSh-G *monappï*. Kw *mono*. SP *monna-*. HOP: *möʔönaŋw* 'son-in-law, in-marrying male'. TRC: Yq *moʔone*. My *móʔone*. Ed *mong^{w}a*. Wr *moʔné*. Rr *moʔné*. CRC: Cr *muʔun* 'son-in-law, daughter-in-law, father-in-law'. Hc *muune* 'daughter's husband, wife's father'. AZT: Na-Cl *mo:ntli*. Pp *mu:nti*

23. A similar term is Ca *-míŋkiwʔa* 'son-in-law'. Although Cahuilla /*i*/ is the regular correspondence of **o as well as **i, Ca *-míŋkiwʔa* may not be cognate with the kinterms in (38a) (Jane Hill, personal communication, 2011). It presumably is related to Ca(SH) *míñikʔi* 'relative', with the medial *-ŋ-* resulting from the assimilation of *-n-* to *-k-* in a *-nk-* cluster created by vowel syncope. Such assimilation, however, appears not to be inevitable in Cahuilla, e.g., *hunkat* 'elderberry'.

The possibility that *moʔo-* or *moʔ-* represents a separate morpheme is suggested by terms for other affinal relatives in some of these same languages:

(38b) [affinal relative]. HOP: *möʔwi* 'daughter-in-law; sister-in-law'. TRC: Wr *moʔóri* 'daughter-in-law'. Rr *moʔorí* 'daughter-in-law'. CRC: Hc *muʔee* 'husband's parent, son's wife' (Grimes and Grimes 1962:110).

Separate morphemes may also be involved in the next set, which includes cognates in Hopi and Yaqui-Mayo only:

(39a) 'to make a circuit around'. (S-435). HOP: *qönìlti* 'to make a circuit, go all the way around'. TRC: Yq-Az *konte* 'to go around, surround (vi)'. Yq-Az *konta* 'to surround (vt)'. Yq *konila* 'around'. My *koónte* 'to go around'

Both Hopi and Yaqui-Mayo include semantically related words that show *qö-* ~ *ko-* followed by elements that do not include *-n-*, and related words in the Numic languages and Nahuatl show the regular correspondence of NUA *-n-* and Nahuatl *-l-*:

(39b) HOP: *qövivita* 'to be whirling, swirling about'. TRC: Yq-Az *kowila* 'around (circumference)'

(39c) *koni. (S-435). NUM: WMn *qooni* 'to return (vi)'. WSh-D *kooni* 'to come and go'. WSh-G *koonih* 'curved, bent'. Cm *koonitï* 'to turn around'. SP *koonni* 'to return, come back by the same road'. AZT: Na-Cl *ko:liwi* 'to curve, to turn'. Na-Cl *ko:loa:* 'to twist, change direction'.

In the remaining four sets, the medial *-n-* appears to occur within disyllabic morphemes:

(40) 'thin, flat'. (S-2278). NUM: WSh-G *kanah* 'thin (of an animal or person)'. AZT: Na-Cl *kana:wak* 'something flat and thin'

(41) 'hill'. (S-1456). NUM: SP *tonnokkiči ~ tunnukkiči* 'knoll, swell in the ground'. TEP:

To(M) *toonk* ‘ridge, dike’. Nv *tonika* ‘hill’

(42) ‘to be’. (S-1317). NUM: NP *mannai* ‘to be, to do’. TRC: Yq *manek* ‘to be situated (containers, liquids, or massed objects). My *manne* ‘to be (of a liquid or gathered objects)’. Wr *maní* ‘to be, to exist’. Ed(L) *mani* ‘to be’. Ed(L) *mane* ‘to be in a container’. Rr *maní* ‘to be in a container’. CRC: Hc *mana* ‘put, hang, spread (plural objects)’. AZT: Na-Cl *mana* ‘to spread something out flat and smooth’.

(43) ‘younger sister’.[24] (S-2001). NUM: NP *pïniʔi*. WMn *pïniʔ*. TRC: Ed *víngʷa*. Wr *piní*. Rr *biní*.

The distribution of the cognates among the UA subfamilies in (40) to (43) may provide a key to explaining the NUA -n- :: SUA -n- correspondence they appear to document. The NUA cognates come only from Numic languages, in the case of each set from a single subdivision, but with all three Numic subdivisions represented, while the SUA cognates are from languages in four separate subfamilies; only the Tubar subfamily is not represented. I cannot offer a definitive explanation for these sets, but a plausible possibility is that the *-n-* in the Numic cognates actually derives from -ŋ-, as discussed in section 4.2. This possibility is especially likely in the case of (43), given the phonological and semantic similarities of the Northern Paiute and Western Mono terms to Timbisha Shoshone *piŋŋa* ‘youngest sibling’ and Chemehuevi *piŋatïm* ‘youngest’ (see set 28).

6. Conclusion

In his overview of the Uto-Aztecan language family, Campbell (1997:136-137) notes that Uto-

24. As in (38) and (39), the initial *pï- ~ pi-* here may represent a separate morpheme. This is suggested by Ls *-pí:t* ‘younger sister’ and Kt *-pit* ‘younger brother or sister’ (cf. Kt *pita-č* ‘youngest, last’), as well as Na-Cl *piʔ-tli* ‘older sister (female speaker)’.

Aztecan historical linguists generally agree on the reconstruction for the Proto-Uto-Aztecan phonemic inventory of five vowel phonemes **/i, a, ï, o, u/ and eleven consonant phonemes **/p, t, c, k, k^w, ʔ, s, h, m, w, y/, disagreeing only on how best to reconstruct the PUA consonants that are reflected in the UA daughter languages as /ŋ, n, r, l/. The data and analyzes presented in this essay support the model shown in Table 8, which I propose as the most parsimonius resolution of the issue.

[Insert Table 8 about here]

In this model, PUA **ŋ and **n are reconstructed in both initial and medial positions with no allophones, while **r is reconstructed only in medial position but with **[r] and **[l] as its allophones. All three PUA phonemes were retained in Proto-Northern Uto-Aztecan and early Proto-Southern Uto-Aztecan, but during the period when the PSUA speech community was still intact, PSUA medial *-n- merged with pre-existing *-r- and the velar nasal *ŋ shifted to *n in all positions. Because these sound changes are documented in all the SUA languages, they can be identified as shared phonological innovations that establish the genetic unity of these languages and the existence of Proto-Southern Uto-Aztecan as the common ancestral language out of which they emerged.

During the course of the diversification of the SUA languages, the most significant changes that occurred in these phonemes were the phonemicization of the allophones of *-r- in Yaqui, Mayo, and the Tepiman languages and the loss of either [-*l*-] or [-*r*-] in Eudeve, Huichol, and the Aztecan languages. Similar changes took place in the NUA languages, with one major exception: PUA **-r- apparently merged with pre-existing *-n- in Proto-Numic. Although the evidence for this innovation is limited, its postulation accounts for the absence of a liquid phoneme in the Numic languages, just as the shift of PUA **ŋ to *n in PSUA accounts for the

absence of the velar nasal in the SUA languages. In the NUA languages, initial *ŋ- merged with *n- in Tubatulabal and the Numic languages while medial *-ŋ- was retained in all subfamilies, although a shift from medial -ŋ- to -*n*- also occurred in some Numic languages.

Apart from contributing to a clarification of the PUA phonemic inventory, this analysis establishes Proto-Southern Uto-Aztecan as a first-level daughter language of PUA coordinate with Proto-Northern Uto-Aztecan. The principal implication of demonstrating that PSUA and PNUA were coordinate intermediary languages is that a split of PUA into two branches can be identified as the first step in the diversification of the language family. Both phonological and lexical data suggest that, following this split, the NUA and SUA branches diversified independently although, as noted in section 2.2, some interaction may have occurred among speakers of the southernmost NUA languages and the northernmost SUA languages (Miller 1984; Cortina-Borja and Valiñas C. 1989; Fowler 1983; Valiñas Coalla 2000; Cortina-Borja, et al. 2002). In contrast, the internal diversification of the NUA and SUA branches likely involved considerable interaction among speakers of languages and dialects belonging to different genetically related subgroups (Shaul 1983; Babel, et al., n.d.).

Babel, et. al. (n.d.) propose that the diffusion of linguistic innovations across language boundaries was a significant factor in the differentiation of the Numic subdivisions. The shift of initial **ŋ- to *n- in Tubatulabal and the Numic languages may indicate that such diffusion occurred across subfamily boundaries, another instance of which could be the shift of medial **-t- to *-l- that Tubatulabal shares with the Cupan subdivision of the Takic subfamily (Hill 2011). A comparable example from the SUA branch involves the Tepiman and Taracahitan languages. Tepiman is defined as a genetic unit based on a number of innovations in its consonant phonemes and by the retention of */ï/, which shifted to /*e*/ or /*e* ~ *i*/ in all the other

SUA subfamilies. Yet, Tepiman shares some of the consonant innovations with neighboring Taracahitan languages, for example *w > /*g*/, *y > /*d*/, and *k^w > /*b*/, all three of which also are found in Eudeve and Ópata (Shaul 1983:97-99; 2010:270-271).

In general, the distribution of phonological innovations within and among genetically related subgroups of the UA language family indicates that some innovations diffused across linguistic boundaries while others did not. This pattern implies alternating periods of interaction and isolation. In addition, the status as lingua franca of Nahuatl and probably one or more of the Tepiman languages (Riley 1971) could have led to the diffusion of innovations in them to other UA languages without innovations in these languages diffusing at all. Multilingualism of speakers of adjacent languages also would have created the conditions in which selective diffusion of innovations between the languages could have taken place. Recognizing the range of possibilities is crucial in defining more precisely the internal structure of the UA language family and to reconstructing the processes that produced it.

Online Appendices

Two online appendices are provided at the following URL: media.brill/ldc/3/1/DUMMY. Online Appendix 1 lists the abbreviations and the sources of data for the languages considered in this essay. Online Appendix 2 comprises cognate sets that are not presented in their entirety in the main text. The introduction to Appendix 2 explains my orthographic conventions and the criteria that I have used to identify cognates and also includes citations of the principal compilations of Uto-Aztecan cognate sets that have been published.

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[TO BE ADDED]

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Table 1. The Uto-Aztecan Language Family

NORTHERN UTO-AZTECAN

- Numic
  - Western Numic
    - Northern Paiute
    - Mono
  - Central Numic
    - Tumbisha Shoshone
    - Shoshone
    - Comanche
  - Southern Numic
    - Kawaiisu
    - Colorado River Numic (Southern Paiute, Chemehuevi, Ute)
- Tubatulabal
- Hopi
- Takic
  - Cupan
    - Cahuilla
    - Cupeño
    - Luiseño
  - Gabrielino-Fernandeño
  - Serrano
    - Kitanemuk

Serrano

SOUTHERN UTO-AZTECAN

Tepiman

Upper Pima (Tohono Oʔodham and other variants)

Lower Pima (Névome, Yepachi Pima, and other variants)

Northern Tepehuan

Southern Tepehuan

Taracahitan

Cahitan

Yaqui-Mayo

Ópatan

Eudeve

Ópata

Tarahumaran

Warihó

Rarámuri

Tubar

Corachol

Cora

Huichol

Aztecan

Pochutec

General Aztecan

Nahuatl

Pipil

Table 2. Alternative Reconstructions of **ŋ, **-n-, and **-r/l-

	PUA	PNUA	PSUA
Alternative 1	**ŋ	*ŋ	*n
	**-r/l-	*-n-	*-r/l-
Alternative 2	**n	*ŋ	*n
	**-r/l-	*-n-	*-r/l-
Alternative 3	**ŋ	*ŋ	*n
	**-n-	*-n-	*-r/l-
Alternative 4	**ŋ	*ŋ	*n
	**-n-	*-n-	*-r-
	**-r-	*-r-	*-r-

Table 3. The Distribution of /r/ and /l/ in the Uto-Aztecan Subfamilies

Subfamily	/r/ and /l/	/r/ only	/l/ only
Numic	—	—	—
Tubatulabal	—	—	Tb
Hopi	Hp	—	—
Takic	Ls	Kt	Ca, Cp
Tepiman	UP, LP, NT, ST	—	—
Taracahitan	My, Yq	Ed	Wr, Rr
Tubar	—	Tbr	—
Corachol		Cr, Hc	
Aztecan			Po, Na-Cl, Pp

Table 4. Numic Reflexes of Proto-Numic *-ŋ-

	/a_a/	/a_i/	/ï_a/	/i_a/	/o_a/	/o_o/	/u_a/
	*taŋa	*aŋi	*nïŋa	*sïŋa	*oŋa	*soŋo	*yuŋa
	‘knee’	‘fly (n)’	‘chest’	‘aspen’	‘salt’	‘lung(s)’	‘scoop (v)’
WESTERN							
NP	ŋ	ŋ	ŋ	ŋ	ŋ	ŋ	ŋ
EMn	ŋ	—	ŋ	ŋ	ŋ	ŋ	—
WMn	n	n	—	—	m	n	—
CENTRAL							
TSh	ŋ	ŋ	ŋ	ŋ	ŋw	ŋw	ŋw
WSh-B	nk	nk ~ n	nk	nk	h	nk	—
WSh-D	nk ~ nn	==	nk ~ nn	nn	h	nk	nn
WSh-G	nk ~ nn	==	nk	nk ~ nn	n	nk ~ nn	nn
ESh	nk	n	n	n	n	nk	—
NSh	nn	==	n	n	n	w	—
Cm	n	==	n	—	n	m	n
SOUTHERN							
Kw	n	n	—	—	∅	∅	—
SP	ŋ	ŋ	==	∅	∅	∅	—
Ch	ŋ	ŋ	ŋ	—	==	∅	—
SUt	∅	==	∅	∅	∅	∅	—

CODES: cognate not attested: —— ; attested word not cognate: == ; loss of -ŋ-: ∅

Table 5. The Regular Correspondence of NUA -ŋ- and SUA -*n*-

	**oŋa	**toŋa	**toŋo	**niŋi	**taŋa	**kuŋa	**soŋo	*piŋa
	‘salt’	‘knee’	‘hot’	‘tongue’	‘contain’	‘husband’	‘lung(s)’	‘pulverize’
NUA								
NUM	-ŋ-	-ŋ-	—	—	-ŋ-	-hm-	-ŋ-	—
TUB	-ŋ-	-ŋ-	—	—	—	-ŋ-	—	—
HOP	-ŋ-	—	-ŋ-	-ŋ-	-ŋ-	-ŋ-	—	-ŋ-
TAK	-ŋ-	—	-ŋ-	-ŋ-	-ŋ-	-ŋ-	-ŋ-	-ŋ-
SUA								
TEP	-n-	-n-	-n-	-n-	—	-n-	—	—
TRC	-n-	-n-	-n-	-n-	—	-n-	-n-	—
TBR	-n-	-n-	-n-	-n-	—	-n-	—	—
CRC	-n-	-n-	—	—	—	-n-	—	—
AZT	—	—	-n-	-n-	-n-	—	—	-n-

Table 6. The PNUA and PSUA Correspondences of Medial *-ŋ-, *-n-, and *-r-

PNUA		PSUA
*-ŋ-	::	*-n-
*-n-	::	*-r-
*-r-	::	*-r-

Table 7. Attested Intervocalic Contexts of PNUA *-ŋ- and *-n-

	*-ŋ-	*-n-
Both *-ŋ- and *-n-		
a_a	*taŋa ‘contain’	*tana ‘foot’
	*mana ‘child’	
	*sana ‘pitch’	
o_a	*oŋa ‘salt’	*konaka ‘necklace’
	*toŋa ‘knee’	
u_a	*kuŋa ‘husband’	*suna ‘heart’
*-ŋ- Only		
i_a	*piŋa ‘pulverize’	
ï_i	*nïŋa ‘tongue’	
o_o	*toŋo ‘hot’	
	*soŋo ‘lungs’	
*-n- Only		
a_i		*kani ‘house’
		*ani ‘small’
ï_ï		*wïnï ‘stand’
u_i		*yuni ‘gentle’
		*yuni ‘pour’

Table 8. Proposed Reconstruction of PUA **ŋ, **n, and **r

PUA		PNUA		PSUA	
Initial	Medial	Initial	Medial	Initial	Medial
ŋ-	-ŋ-	ŋ-	-ŋ-	n-	-n-
n-	-n-	n-	-n-	n-	-r-
—	-r-	—	-r-	—	-r-

Figure 1. The Distribution of the Uto-Aztecan Subfamilies at Initial European Contacts