Application of the Comparative Method to Morpheme-Final Nasals in Nivkh

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Following up on recent work, we consider morpheme-final nasals in the Nivkh language family of northeast Asia using the Standard Comparative Method, and attempt to reconstruct the inventory and morphophonemic behavior of morpheme-final nasal phonemes in Proto-Nivkh (PN). Previous work has pointed towards PN nasals at four loci, /*m/, /*n/, /*ɲ/, /*ŋ/, of which at least /*ŋ/ could be phonemically either "strong", triggering fricatives to surface across morpheme juncture, or "weak", triggering plosives to surface; with weak /*ŋ/ place-assimilating to following plosives across morpheme juncture, and weak /*n/ and weak /*ŋ/ elided in the Amur and West Sakhalin lects. However, with the benefit of more and better data than were available to previous authors, we find instead that elision must have been conditioned by a feature other than the strong-weak contrast (provisionally, length), but which interacted with the strong-weak contrast ("short" strong nasals were inextant), and that this "length" contrast also conditioned assimilation or non-assimilation of final /*ŋ/ (only "short" weak /*ŋ/ assimilated, not "long" weak /*ŋ/). We confirm that the strong-weak morphophonemic contrast existed for at least /*m/, /*ɲ/, and /*ŋ/ (rather than only for /*ŋ/), and the "length" contrast for /*n/ as well as /*ŋ/.
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1. Introduction

The Nivkh family of languages is indigenous to Sakhalin Island in northeast Asia, the adjacent mainland coast, and the lower course of the Amur River. For our purposes, we will consider the family to consist of six distinguishable lects or varieties: Amur Nivkh (AN), spoken on the Asian mainland, West Sakhalin Nivkh (WSN), originally spoken on the northwest corner of Sakhalin Island nearest to the mainland, North Sakhalin Nivkh (NSN), spoken originally on the Schmidt Peninsula at the northern tip of Sakhalin, East Sakhalin Nivkh (ESN), South Sakhalin Nivkh (SSN), and the modern, koineized variety of Nogliki (NgN). The approximate geographic distribution of these varieties is shown in Figure 1. Particularly relevant sources for these varieties include the dictionaries of Savel'eva and Taksami (1965; 1970) for AN; the work of Shiraishi (especially Shiraishi, 2007), for WSN; Austerlitz' work (e.g., 1982; 1990), as well as the pioneering work of Hattori (1962a; 1962b; 1962c), for SSN; and Tangiku et al. (2008) for NgN. Overviews of the family, including its phonology in particular, are provided in Gruzdeva (1997; 1998) and Shiraishi (2007). Fortescue (2016) is an excellent comparative dictionary, and also gives heuristic proto-forms, but does not approach specific phonological correspondences or diachronic developments in detail. Halm (2017) and Halm and Slater (2018) apply the comparative method to data from the attested Nivkh varieties to identify exact sound changes which have distinguished the attested varieties from Proto-Nivkh (PN),[2] and Halm and Slater (2018) also very briefly considers the internal phylogeny of the family in view of these sound changes.[3]

1.1. The Nivkh phonemic inventory and the presentation of data. The (maximal) consonant inventory of all varieties is shown as we will transcribe it in Table 1, below. AN, WSN, and probably NSN differ in lacking a contrastive [w][4] in syllable onset. Although we can confidently reconstruct the contrasts /*i ≠ j/ and /*u ≠ w/ postvocalically in Proto-Nivkh due to a conditioned sound change (Halm, 2017), some sources fail to make this or other glide-vowel distinctions transcriptionally, at least in certain environments (such as failing to distinguish /Vu/ from /Vw/ when another vowel does not immediately follow, or /iV/ from /jV/ when preceded by a consonant). It is not perfectly clear which of these are phonologically real mergers or gaps in these environments, and which are merely orthographic shortcomings. That is, the varieties described in those sources may have these contrasts, but the writing systems used in those sources do not reflect the contrast. Where this non-distinction occurs, and

[2] The sound changes by which the attested Nivkh varieties have developed from Proto-Nivkh are primarily the following: PN /*a, *i, *u/ > AN, WSN, NSN /ə/ before a glide, but not as the first element of a true diphthong (both are attested); PN /*a/ > AN, WSN, NSN /ə/ when adjacent to or tautosyllabic with a velar consonant and not prohibited by vowel harmony or similar adjacency to a postvelar consonant; PN /*i/ > AN, WSN /ə/ |/[t,d]_+/; PN /*w/ > AN, WSN, NSN, NgN /β/ in the syllable onset; PN /*mx, *mχ/ > AN, WSN /ŋk/; PN /*ŋq/ > AN, WSN /ŋk/ morpheme-finally, and probably in all positions; PN /*χ/ > AN, WSN /x/ |/o(C)_/ ; PN /*n/ > AN, WSN /ɲ/ before a front vowel /i/ or /e/; PN alveolar oral obstruents are phonetically palatalized but still contrast with the palatal oral obstruents in WSN before a front vowel /i/ or /e/, while the contrast is leveled (at least transcriptionally) in AN sources in this same environment; PN voiced velar and postvelar fricatives in /V_C/ may be elided with compensatory vowel length in AN, WSN, NSN, with the changed and unchanged forms generally appearing in free variation; PN clusters of a palatal and an alveolar consonant generally assimilate to alveolar articulation for both segments, both historically and synchronically, in NgN, ESN, and SSN: both palatal oral obstruents and the palatal nasal seem to assimilate when followed by any alveolar consonant, while perhaps only the palatal oral obstruents (and not the nasal) assimilate when preceded by an alveolar; PN /*x/ > SSN, NgN /χ/ |/[c$^{(h)}$,t$^{(h)}$]_[a,o]/, and PN /*x/ > NgN /χ/ |/c$^{(h)}$_/ regardless of vocalism; and finally, SSN initial consonant clusters of a lenis consonant followed by a voiceless fricative assimilate to fortis manner for both members of the cluster. A single series of SSN plosives, described variously as either lenis, voiced, or weakly voiced (here transcribed simply as voiced) corresponds to both unaspirated voiceless and voiced plosives in all other varieties, although the direction of the diachronic change giving rise to this situation (i.e., either a merger in SSN or a conditioned split in all other lects) is unclear.

[3] Although we may nevertheless prefer as a matter of methodology to take the changes distinguishing these six lects at face value, we should keep in mind for sociolinguistic or historical purposes the possibility that NgN may be as much a doculect as a distinct spoken variety, and that the separation between AN and WSN is extremely shallow at best, and may be partly documentary rather than purely geographic as well.

[4] We will use an asterisk to indicate our reconstructions, /*ɸorm/; the degree symbol to indicate Fortescue's (2016) typical or canonical forms, /°ɸorm/; double-asterisk to indicate notably unattested or impossible forms, /**ɸporm/; single tilde to represent predictable phonological or grammatical variation due to known processes, /ɸorm ~ p^{h}orm/; double tilde to represent unpredictable or inexplicable variation or doublets, /ɸorm ≈ βorm/; hyphen to mark a synchronically productive or otherwise well-understood and uncontroversial morpheme boundary, /ɸorm-i/; double hyphen or equal sign to indicate a conjectural morpheme boundary, /*ɸ=orm/; the point or period to mark syllable boundary, /ɸorm.gun/; square brackets within slashes to indicate an uncertain reconstruction or a doubtful transcription, /[ɸ]orm/; parentheses to indicate that a form can or does appear both with and without the enclosed segment or segments, /(ɸ)orm/, equivalent to /ɸorm ≈ orm/. The sign /V/ is used to indicate an unspecified vowel; the sign /C/ to indicate an unspecified consonant; and the sign /W/ to indicate an unspecified glide. Single chevron or shaftless arrow is used to indicate diachronic change, /*ɸorm/ > /ɸor/; double chevron to indicate synchronic processes /t^{h}uŋ-ɸorm/ » [t^{h}umborm]; and bidirectional chevron or bidirectional shaftless arrow is used to indicate cognacy, WSN /ɸorm/ <> AN /ɸorm/.

comparative sources do not illuminate the correct phonemicization, we will follow our sources in the transcription of the undifferentiated segment. Note also that SSN differs from the inventory presented in Table 1 by lacking a contrast between the voiced and the voiceless unaspirated plosive series. All varieties have a six-vowel inventory, which we will transcribe as /a, e, i, o, u, ə/, although the phonetic realization of these may be closer to [æ, ɪe, ɪ, o, u, ɤ] in at least some varieties.

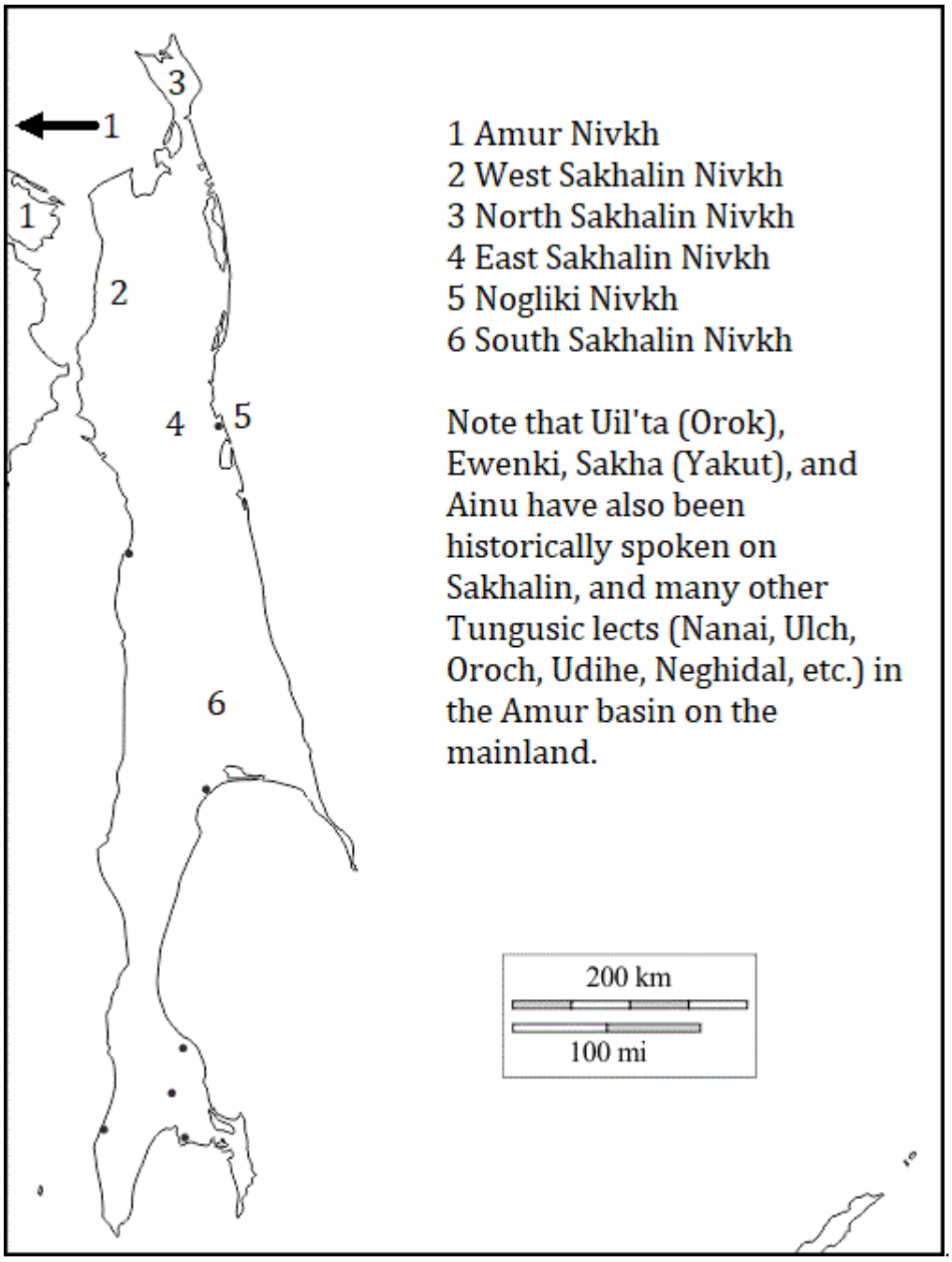

Figure 1: Approximate geographic distribution of Nivkh lects. Dots represent major settlements. Modified from an image available on www.d-maps.com.

1.2. Initial consonant alternation. A feature of Nivkh which is often commented upon, not only because of its centrality and high functional load within the language, but also because of its cross-linguistic typological interest, in known as "initial consonant alternation" or "initial consonant mutation" (Gruzdeva, 1998, pp. 13-15; Shiraishi, 2000; 2007, p. 58 ff; Mattissen, 2003, p. 44 ff. et alibi; Otaina & Nedjalkov, 2013, pp. 15-17; Luukkonen, 2016). In certain syntactic complexes (principally: a direct object, recipient, or undergoer nominal followed by its head verb; or a possessor nominal followed by its head nominal, though other contexts also occur — see Luukkonen 2016, pp. 17-19), the initial phoneme of the following element or *target* predictably changes its surface form or *alternates*, if it is an oral obstruent, based on the final phoneme of the preceding element in the syntactic complex, or *trigger*: a final plosive, vowel, or glide in the preceding element (including an elided vowel-final prefix in transitive verbs without other object marking) triggers a fricative to surface as the alternating first phoneme of the target; while a fricative in final position in the trigger causes a voiceless plosive to surface as the alternating initial consonant of the target. There are exceptions or added complexities overlaid on this basic system in all Nivkh lects (such as the strong final fricatives reported only by Hattori in SSN, or the handling of recently borrowed words), but the system of initial consonant alternation just described holds uniformly across the language family as the basic skeleton of the phenomenon.

	Bilabial	Alveolar	Palatal	Velar	Postvelar
Fortis Stop	pʰ	tʰ	cʰ	kʰ	qʰ
Lenis Stop (*Non-Contrastive in SSN*)	[p]	[t]	[c]	[k]	[q]
Voiceless Fricative	φ	r̥	ṡ	x	χ
Voiced Fricative	β	r	ż	ɣ	ʁ
Voiced Stop	b	d	ɟ	g	ɢ
Nasal	m	n	ɲ	ŋ	
Approximant	[w]		j		
Lateral		l			
Voiceless Onset	h				

Table 1. Transcription of the (maximal) Nivkh consonant inventory. All unbracketed phonemes are reconstructed for Proto-Nivkh and attested in all modern varieties, while the bracketed phonemes are not distributed uniformly: /w/ is reconstructed for PN but has been merged into /β/ in the syllable onset in AN, WSN, and NSN. The contrastive voiceless unaspirated (i.e. lenis) stops /p, t, c, k, q/ are present in all varieties except SSN. In the remaining lects, they are in superficially contrastive but underlyingly complementary distribution with the voiced stops /b, d, ɟ, g, G/, both of which correspond to voiced stops in SSN: namely, outside of SSN, the voiced stops occur in some environments morpheme-internally, and morpheme-initially when preceded across a morpheme juncture in certain constructions by /l/ or a nasal, which may be elided so that voicing of the following plosive is its only surface-level reflex; in all other environments, the SSN voiced stops correspond to voiceless unaspirated stops in the other lects. No postvelar or uvular nasal is described in any source.

One feature of the consonant alternation system which shows major differences between the attested Nivkh lects, however, is what phone surfaces in the target when the triggering phoneme is a nasal. In addition to this morphophonemic variation within the family, there are also nontrivial correspondences between the segmental realizations of the nasal phonemes among these varieties in morpheme-final position. The object of the present paper will be to apply the Standard Comparative Method to both the surface forms and the morphophonemic properties of morpheme-final nasals as triggers of initial consonant alternation, and attempt to reconstruct the Proto-Nivkh system of final nasals, in terms of both its segmental and morphophonemic characteristics. Previous authors have made notable efforts in this direction (e.g., Gruzdeva, 1997). However, we now have the benefit of a

wider and higher-quality pool of sources and data from which to work. As we will see, this will allow us to reconstruct a Proto-Nivkh system which differs from that which has been previously postulated, and also displays intriguing differences from any of the systems attested by the living Nivkh lects.

1.3. Previous characterizations of Nivkh nasals as initial consonant alternation triggers. While most of the sources which discuss the initial consonant alternation phenomenon include nasals within the scope of their discussion, two previous works merit particular mention. Hattori, in a series of articles (1962a; 1962b; 1962c), gives detailed descriptions of not only the inventory, but also the morphophonemic behavior of phonemes in the South Sakhalin (SSN) variety, including the behavior of the final nasals as triggers of initial consonant alternation. In his description, all instances of SSN /m, n, ɲ/, along with all instances of /l/ and some instances of /ŋ/, which he labels /ŋ$_1$/, trigger fricatives to surface in the initial position of following target morphemes, while the remaining instances of /ŋ/, which he labels /ŋ$_2$/, cause a plosive to surface. Furthermore, Hattori notes that /ŋ$_2$/ undergoes place assimilation to the locus of following oral obstruents or heterorganic nasals and elides to [Ø] when adjacent to initial /ŋ/ in the following morpheme, while /ŋ$_1$/ neither assimilates nor elides. Succeeding work often refers to Hattori's /ŋ$_2$/ as a "weak" nasal, and to /m, n, ɲ, ŋ$_1$/ as "strong" nasals. Hence, for example, SSN /geŋ$_1$/ 'whale', when combined in a complex with lexemes such as /du̯/ 'meat', /c^{h}i-/ 'to put', or /Go-jru-/ 'to dive, drown', triggers fricatives: [geŋru̯] 'whale meat', [geŋṡi-] 'to put a whale', [geŋʁoju-] 'to drown a whale'; whereas /eχaŋ$_2$/ 'cow' in the same environments both undergoes place-assimilation of its final nasal and triggers plosives to appear: [eχandu̯] 'beef', [eχaɲc^{h}i-] 'to put a cow', [eχaŋGojru-] 'to drown a cow' (Hattori 1962b, p. 75).

Some final /ŋ/ are phonetically elided in Amur, West Sakhalin, and North Sakhalin lects (as well as final /n/ in a very few etyma) while remaining morphophonemically present as triggers of consonant alternation.[5] That is to say, in the surface forms of morphemes and etyma with elided final velar nasals in AN, WSN, and NSN, the original nasal has a completely null phonetic realization in all environments, despite the segment remaining purely as a morphophonemic trigger stored in the lexicon. For example, AN /ku/ 'day, 24-hour period' and AN /ku-Ø$_W$/ < PN /*ku-ŋ/ 'that (deictic attributive for absent or invisible referents)' are identically realized as [ku] in AN regardless of following morpheme or pause, but have different morphophonemic triggering behavior, e.g. /ku-keś/ » [kuxeś] 'today's news' ≠ /ku-Ø$_W$-k^{h}eś/ » [kuk^{h}eś] 'that news'. It has often been suggested that SSN weak /ŋ$_2$/ corresponds regularly to elided AN, WSN, NSN /*ŋ > Ø$_W$/, while strong /ŋ$_1$/ corresponds to unelided AN, WSN, NSN /ŋ/ (although we shall see below that this is not in fact the case, per se).

Some decades later, (Gruzdeva, 1997) sought to synthesize Hattori's work with the variety of other sources then available (which skewed particularly toward the Amur variety) as well as with her own data, in order to create a picture of nasals as triggers of consonant alternation across the entire Nivkh family. What emerged, however, was a picture of complicated and thorough disagreement among sources: while major sources for AN (e.g., Krejnovich, 1937; also recapitulated later with a number of supporting examples in Mattissen, 2003) portrayed a system which differed from that described by Hattori, Gruzdeva's own data seemed to agree poorly with both the AN system described by previous authors and the SSN system described by Hattori. Very roughly speaking, previous descriptions of AN included a strong-weak morphophonemic contrast, much like Hattori's /ŋ$_1$/ ≠ /ŋ$_2$/, for nasals at *all* loci (at least in some constructions), instead of merely the velar, while Gruzdeva interpreted her own data as reflecting a morphophonemic behavior of nasals which *lacked* such a contrast entirely, with the morphophonemic triggering behavior of final nasals determined syntactically, albeit with exceptions. Gruzdeva's interpretation of this was that the AN system had shifted from a previously phonologically-determined system of alternation, something like the SSN system, towards a more syntactically-determined one, with irregularities reflecting as-yet incomplete loss of the old system (1997, p. 94). However, she declined to address the differences which nonetheless remain between the AN system described by Krejnovich and others, or its pre-AN hypothetical predecessor, and the SSN system described by Hattori.

1.4. New data, and a new approach. A major limitation which faced previous authors attempting to compare the morphophonemics of final nasals across the Nivkh family is that while descriptions of the *systems* of SSN and AN were available, the actual published data and examples were so scarce that comparison of the behavior of specific *etyma* across the family was essentially impossible — that is to say, the Standard Comparative Method, in its

[5] We transcribe these phonetically elided but morphophonemically present final nasals as /Ø$_W$/.

canonical form, could not be applied meaningfully to this morphophonemic question, because simply too few cognates were documented in terms of their morphophonemic behavior in more than one lect.

In the decades since Gruzdeva considered this question, however, further work has provided a new opportunity to approach the issue from a slightly different and more promising direction. New fieldwork has been done, especially by Shiraishi and Lok, with the West Sakhalin (WSN) lect, which groups very closely with AN (Shiraishi, 2007; Fortescue 2016, p. 1; Halm & Slater, 2018, pp. 35-37), one result of which is a series of sound recordings with transcription and glossing titled "Sound Materials of the Nivkh Language" (SMNL). SMNL includes both rehearsed narrations and spontaneous conversations, and is available in twelve volumes so far, with more continuing to appear up to the present. Luukkonen (2016) has multiplied the utility of these new data to questions of consonant alternation by creating a database of consonant alternation environments and realizations which appear in SMNL.

Thankfully, SMNL and Luukkonen's database thereof, taken together with Hattori's work and earlier documentation of AN, aided as well by the recent etymological dictionary of Fortescue (2016), have finally pushed the size of the corpus of data available over the limiting threshold faced by Gruzdeva and other earlier authors. The possibility now exists to apply the Standard Comparative Method to the morphophonemic behavior, as well as the segmental realization, of a meaningful number of etyma. Such an application is the object of this paper.

1.5. Outline of the paper. In section 2, some preliminaries will be discussed in order to focus and simplify the following discussion. In section 3, the status of the strong-weak morphophonemic contrast in AN, WSN, and their immediate common ancestor Proto-Western Nivkh will be discussed, including diachronic changes which have affected the system since the first written records of Nivkh were made. Then, in section 4, segmental correspondences between the Nivkh lects will be discussed, especially elision of some original final nasals in AN, WSN, and NSN, before moving on in section 5 to the juxtaposition and integration of the morphophonemic and segmental evidence. Section 6 brings all the evidence together to attempt a reconstruction of Proto-Nivkh final nasals as a complete system of phonemes defined by both segmental and morphophonemic contrasts, with final conclusions offered in section 7.

2. Preliminaries

Before we grapple with the central questions and arguments of the paper, we may be well served to first address a few preliminary caveats and marginal phenomena, the setting aside of which will help to simplify our discussion below. First, it should be noted that nouns which display an initial fricative[6] in their isolated or citation form evidently do not participate in initial consonant alternation at all, in any Nivkh variety. Although this non-alternation is only specifically described for SSN (Hattori, 1962b; 1962c), WSN (Shiraishi 2007, pp. 96-97), and AN (Gruzdeva, 1997), it seems safe to extrapolate it across the family, not only because of the distant separation of these lects (Halm & Slater, 2018, pp. 35-37), but also because fricative-initial nouns are extremely marginal in Nivkh (Fortescue, 2016), arising from recent loans, such as /śeta ≈ ṡetaŋ/ 'sugar' (ultimately from Chinese); onomatopoeia, such as /ralŋ/ 'frog'; or perhaps from nouns which due to their semantics cannot be conceived without a possessor, and hence bear the elided vowel possessor prefix /Øᵥ- < *i-/ even in citation, such as /ruβŋ/ (< /*i-tuβŋ/ ?) 'blood relative, person belonging to the same clan'. Since such fricative-initial nouns never alternate, regardless of the triggering final phoneme in the preceding morpheme, they must be excepted from many statements made below, and will be excluded from the remainder of our discussion without further mention.

A second important preliminary concerns the status of voiced stops, as distinguished from unaspirated voiceless ones, in initial consonant alternation. Previous descriptions of AN and WSN (e.g., Gruzdeva, 1997, p. 84 et alibi; Mattissen, 2003, p. 47 et alibi; Nedjalkov & Otaina, 2013, p. 16 et alibi) have tended to repeat that nasals which trigger a plosive to surface as the realization of a lenis initial consonant — that is, weak nasals triggering alternation of a target head with a lenis initial obstruent — cause specifically a *voiced* plosive to surface. This differs, under these descriptions, from fricatives acting as triggers, which in the same situation would cause a *voiceless unaspirated* plosive to surface. This characterization has been broadly accepted at face value, which has led authors who have previously approached the issue of final nasals to characterize the surfacing of voiceless unaspirated plosives triggered by weak nasals as an irregularity (e.g., Gruzdeva, 1997, p. 87; Luukkonen, 2016, p. 43 as a methodological stricture, though see below). However, when we consider under what circumstances this voicing contrast can be

[6] For our purposes, only /ɸ, r̝, ṡ, x, χ/ and their voiced counterparts will be considered fricatives, which is to say that /h/ will not be.

responsible for actually distinguishing one possible utterance from another, we may reasonably conclude that such a characterization is overly particular, at least in a specifiable majority of instances.

To be brief, there are only two clear circumstances in which the voicing contrast (as opposed to the fricative-plosive contrast) could actually distinguish between different interpretations of an utterance, and hence be considered to be phonemic, rather than merely allophonic. The first of these would be distinguishing a verbal object or nominal possessor with an elided nasal from one which lacks it, but is otherwise segmentally identical, ending in a fricative. For example, two AN etyma (one hypothetical), /aɻ/ 'male animal' ≠ /**aɻØW < aɻŋ/ 'unicorn' would be distinguished from one another only by voicing of the alternating initial plosive of the verb in the phrases /aɻ-kep-ɟ/ [aɻkepɟ] 'seizes a male animal'[7] ≠ /**aɻØW-kep-ɟ/ [argepɟ] 'seizes a unicorn'; however, such minimal pairs are at best exceptionally rare. The other opportunity for the voicing contrast to be phonemic would be its distinguishing a syntactic complex (in which initial consonant alternation does operate) from a non-complex construction (in which consonant alternation does not operate). For example, /keŋ co-ɟ/ [keŋ coɟ] 'a whale bends (intransitively)' ≠ /keŋ-ɟo-ɟ/ [keŋɟoɟ] '(someone) bends a whale'.[8] These scenarios, while at least rising to the level of constituting a linguistic reality, are nonetheless rare, being limited to verbs which can be either transitive or intransitive without any derivational morphology (evidently a closed class in Nivkh), and which begin with a lenis obstruent. Thus, we can see that while the voicing contrast in plosives in initial consonant alternation *can* be contrastive, in overwhelmingly most cases, it does not serve to distinguish one etymon or utterance from another — this being the case, we might go so far as to call this voicing allophonic outside of the limited exceptions which we have just outlined. Indeed, in SSN, where nasal elision is absent as a phenomenon, the distinction between voiced and voiceless unaspirated plosives (to the extent that it exists at all) is always purely allophonic. In fact, Luukkonen discusses the status of the voicing distinction in plosives (2016, pp. 43, 54, et alibi), calling it "barely [a] contrastive feature in Nivkh" and describing it as "a freely varying feature for most speakers" (pp. 58-59), and actually ignores it in his analysis of his own fieldwork data (2016, p. 25, fn. 6). This differs markedly from the plosive-fricative contrast, the aspiration contrast in plosives, and the voicing contrast in fricatives, which are always phonemic or morphophonemically contrastive, and all carry heavy functional loads. Bearing this in mind, for the remainder of this paper we will in fact actually ignore irregularities of (allophonic) plosive voicing in initial consonant alternation wherever they are noncontrastive. As we will see, eliminating this allophonic and rather variable voicing from consideration — focusing our morphophonemic attention instead on the contrast between plosive-triggering and fricative-triggering nasals — will add considerable clarity to the picture of Nivkh final nasals as consonant alternation triggers, and calm the disorder which initially confronts us in the data.

Finally, it ought to be mentioned that the lateral /l/ (the only sonant in the Nivkh inventory aside from the nasals) could most likely be productively included in the present discussion, since all accounts of the various lects seem to indicate that it patterns with some or all of the nasals as a trigger of consonant alternation, and laterals and nasals often pattern similarly cross-linguistically (Mielke, 2005)[9]. Unfortunately, we simply lack the data at the present time to confidently bring this phoneme into our considerations, especially in SMNL, where it seems to be underrepresented as a consonant mutation trigger merely as a matter of chance. We hope that future fieldwork will remedy this situation. With these preliminary considerations out of our way, we can now move on to the central arguments of the paper.

3. The Strong-Weak contrast in Amur & West Sakhalin Nivkh

As mentioned above, that contrast between two morphophonemic classes of phonetically identical nasals first reported by Hattori (1962b; 1962c) — a "strong" class /NS/ which trigger fricatives to surface in targets in initial consonant alternation, parallel to the behavior of plosives, versus a "weak" class /NW/ which trigger plosives to surface — has become a foundational assumption of essentially all later descriptions, not only of SSN, but of all varieties.

[7] Please note that all constructions in the "Preliminaries" section are the authors' inventions for the purpose of illustration, rather than actual data.

[8] Even in these constructions, in fact, stress may also distinguish the two alternatives (Mattissen, 2003, pp. 85-92), but stress is unfortunately a very understudied facet of Nivkh language, and we hesitate to assert that stress would always serve to reinforce the distinction indicated by the plosive voicing contrast, or compare their functional significance in listener comprehension — we simply lack the data to assess such a claim.

[9] Thank you to an anonymous reviewer for bringing this study to our attention.

However, whereas Hattori reports such a contrast for only the velar nasal /ŋˢ/ ≠ /ŋʷ/[10] in SSN, at least some descriptions of AN, such as Mattissen (2003), who is in turn working from earlier sources such as Krejnovich and Panfilov, have asserted a strong-weak contrast for the nasals at all four loci, /mˢ, nˢ, ɲˢ, ŋˢ/ ≠ /mʷ, nʷ, ɲʷ, ŋʷ/. Mattissen (2003, pp. 45-46), for example, reports /cʰəlmˢ/ 'palm of the hand', /anˢ-/ 'also', /meɲˢ/ 'rudder', and /loŋˢ/ 'moon' with strong final nasals; and /kelmʷ/ 'raspberry', /əkənʷ/ 'elder brother', /eɲʷ/ 'ski (n.), /kʰeŋʷ/ 'sun', and /ŋirØʷ/ 'dish, cup' with weak final nasals.

In contrast to these earlier descriptions, Gruzdeva (1997), examining her own much more recent data collected first-hand in addition to a near exhaustive catalogue of earlier sources (p. 80), posits an analysis of the Amur lect's system of final nasals in which there is *no strong-weak contrast*, either at the velar locus or at any of the other loci, and in which the alternation-triggering behavior of the nasals is determined purely by the fortis or lenis feature of the target alternating consonant and the syntactic construction which brings about alternation, albeit with many exceptions in the data. Gruzdeva's rule for AN is that head nouns alternate to plosives after all nasals[11] (with lenis-obstruent-initial target nouns surfacing with initial voiced plosives and fortis-obstruent-initial target nouns surfacing with voiceless aspirated plosives), while for target verbs, those with a lenis initial obstruent again alternate to a (voiced) plosive after all nasals, but those verbs with a fortis initial obstruent instead alternate to a (voiceless) fricative after all nasals (pp. 86-92).

While Gruzdeva very helpfully provides copious examples which illustrate that her system does indeed account for a good fraction of the data, she also very forthrightly provides examples of data which defy her proposed system. Critically, though, these counterexamples betray a striking asymmetry which is only partially articulated by the original author, and which, as we will see, is emphatically confirmed as a real characteristic of the consonant alternation system by the data from SMNL. Specifically, target nouns following a nasal *always* surface with a plosive, with only one exception in 71 examples provided by Gruzdeva (1997), and only four exceptions out of about 260 examples in SMNL, all four of which were provided by the same speaker.[12] On the other hand, by contrast, 10 out of 59 target verb examples given by Gruzdeva (1997) defy her rule, while in SMNL, the fraction of target verbs breaking the rule exceeds two thirds (about 68%). What this should immediately suggest to us is that while AN and WSN target *nouns* do indeed systematically alternate as though all nasals were weak, with only trivial exceptions, just as Gruzdeva describes, Gruzdeva's description does not capture the behavior of target *verbs* very well. We must then ask whether a strong-weak contrast among the nasals does indeed exist in AN and WSN, albeit only in complexes with target head verbs. As we shall see, the evidence firmly supports the existence of such a contrast in modern WSN, and probably also in closely-related AN.

3.1. The strong-weak contrast in West Sakhalin Nivkh. Luukkonen (2016) has compiled over two thousand instances of initial consonant alternation from the SMNL materials into a database, enabling us to investigate patterns within this phenomenon with greatly increased efficiency. Although, as mentioned above, all final nasals uniformly trigger plosives to surface in target nouns in these data, target verbs show a relatively even division between initial plosives and initial fricatives after nasals within the 31 different nasal-final etyma and suffixes represented as triggers for target verbs, in 164 separate instances of consonant alternation.

Whereas Gruzdeva's rule suggests that all lenis-initial target verbs should surface with plosives and all fortis-initial target verbs with fricatives, Luukkonen's data contain 11 out of 40 (28%) lenis-initial target verbs surfacing with a fricative, while 94 out of 124 (76%) fortis-initial target verbs surface with a plosive. Thus, these data conform very poorly to Gruzdeva's posited rule, as Luukkonen (2016, p. 44) notes, judging that "post-sonorant [consonant mutation] is indeed highly variable, to the extent that [Gruzdeva's guidelines] are not really applicable."

Since many of these 31 nasal-final morphemes are represented in multiple instances, we can observe that this variation between "weak" triggering behavior with a plosive surfacing as the initial obstruent of the target head verb and "strong" behavior in which a fricative surfaces in the target is not random, but is quite clearly a function of what morpheme the triggering nasal appears in: of the 31 nasal-final morphemes, 25 are either consistently weak, or consistently strong — only six display both strong and weak triggering behavior.

[10] That is, /ŋ₁/ ≠ /ŋ₂/ in Hattori's notation, with Hattori's /ŋ₁/ = our /ŋˢ/ and Hattori's /ŋ₂/ = our /ŋʷ/.

[11] Excepting fricative-initial nouns, which do not alternate. See the *Preliminaries* section, above, regarding nouns which are fricative-initial in isolation.

[12] This ignores variation in voicing where the voiced–voiceless unaspirated plosive distinction is not contrastive, as described in the *Preliminaries* section.

Moreover, with one exception (the anthroponym /ɸugun ≈ ɸogun/), all of the morphemes which vary between strong and weak triggering behavior fall into a clear pattern, already remarked upon by Shiraishi (2000, pp. 111-112; 2007, pp. 33, 98-99). Namely, these five inconsistent morphemes feature an elided or "floating" nasal /Øᵂ/[13] as their final consonant. Shiraishi records that while in the speech of older speakers, these elided final nasals, which correspond to unelided /ŋ/ or /n/ in ESN and SSN cognates, trigger plosives to appear (i.e., they are weak nasals morphophonemically, even though their surface realization is null, [Ø]), in the speech of younger AN and WSN speakers, there is a gradual loss of these elided nasals diffusing through the lexicon, so that the phoneme to the left of the historical elided nasal acts as the trigger for consonant alternation, and the nasal which was already phonetically elided is now morphophonemically ignored as well, and completely lost. That is, a sound change deleting AN, WSN /Øᵂ/ is currently progressing through the lexicon. Shiraishi refers to this phenomenon as "transparent application of consonant mutation".[14] Excepting the anthroponym /ɸugun ≈ ɸogun/, all five of the morphemes which the SMNL data show as varying between strong-nasal-type triggering and weak-nasal-type triggering have such an elided final nasal: /(h)eˌqØᵂ/ 'side'; /imɣuØᵂ/ 'they'; /oɣlaØᵂ/ 'child'; /umguØᵂ/ 'wife'; and /-kuØᵂ/ |PL|, and in all of these the elided final nasal is preceded by a plosive or a vowel, so "transparent application" would be expected to trigger a fricative to surface in following target head verbs. All of these, moreover, show a preponderance of instances in the SMNL data in which they behave as weak, compared to a minority of cases in which they behave as strong or "transparent." The tally is 9 instances of weak triggering versus 1 of strong triggering for /(h)eˌqØᵂ/; 24:2 for /imɣuØᵂ/; 6:2 for /oɣlaØᵂ/; 8:1 for /umguØᵂ/; and 32:11 for /-kuØᵂ/.

Thus, once we account for the documented attritional phenomenon of "transparent application," we see that the SMNL data not only do show a phonemic strong-weak morphophonemic contrast in final nasals when the target is a verb, but that in fact this contrast is perfectly regular: a given morpheme (modern attritional phenomena and one anthroponym notwithstanding) either always behaves as a weak trigger, causing a plosive to surface in the target, or always behaves as a strong trigger, causing a fricative to surface. This conclusion, made possible by the tireless recent work of Shiraishi, Lok, and Luukkonen, proves to be a key, with which we can unlock earlier data (Gruzdeva, 1997; and Mattissen, 2003, in particular) on Amur Nivkh, and which in turn ultimately allows us to draw new and better supported conclusions concerning the situation in Proto-Nivkh and historical developments in the language family.

3.2. Do the data for Amur Nivkh and WSN agree as to which etyma are strong and weak? The pattern in Gruzdeva's (1997) examples with verb targets is less clear-cut than the pattern in the SMNL data. However, if we adopt the assumption that in some morphemes with a final nasal, that nasal is (morpho)phonemically weak, while other morphemes' final nasals are (morpho)phonemically strong, we will then require fewer exceptions to account for the data than Gruzdeva's stated rule does. The best possible solution, though, requiring the fewest exceptions, is provided by assuming that Gruzdeva's data show the AN lect to be in the process of transition from the WSN system with a phonemic strong-weak contrast toward Gruzdeva's postulated system of all nasals acting as weak with lenis-initial target verbs but strong with fortis-initial target verbs.

Gruzdeva's examples with target verbs attest 33 distinct triggering morphemes in 59 separate instances of alternation. Only eight of these morphemes[15] vary between strong and weak triggering behavior, of which three terminate in an elided nasal preceded by a vowel, and thus can be accounted for by transparent application of consonant mutation. Four of the remaining five etyma obey Gruzdeva's rule perfectly (/cʰəŋ/, /ŋirØᵂ/, /əβŋ/, and /əkən/), while the fifth, /qanØᵂ/ displays weak triggering of both lenis- and fortis-initial target verbs, and also at least one instance of strong triggering of a fortis-initial target verb — i.e., an incomplete transition from being phonemically weak historically towards obeying Gruzdeva's rule. By contrast, assuming Gruzdeva's rule without a preceding historical stage out of which the language has not yet completely transitioned, and in which a phonemic strong-weak contrast existed, yields twice as many exceptions (10 etyma fail to follow this formulation).

We can reinforce the strength of this analysis of the AN system by combining the data from (Gruzdeva, 1997) with those from (Mattissen, 2003, pp. 45-46), and with the WSN data from SMNL. Since AN and WSN are very closely

[13] Shiraishi notates this phoneme with superscripted /ᴺ/.

[14] Note that Luukkonen (2016, p. 24 et alibi) devotes considerable attention to this phenomenon, and investigates the extent to which it can be shown quantitatively to be generationally correlated. Mattissen (2003, p. 43) also mentions it.

[15] Viz.: /cʰəŋ/ 'you'; /meucu[Øᵂ]/ 'rifle' – a Tungusic loan; /oɣlaØᵂ/ 'child'; /qanØᵂ/ 'dog'; /ŋirØᵂ/ 'cup, bowl'; /əβŋ/ 'oar'; /əkən/ '(elder) brother'; and /-kuØᵂ/ |PL|.

related, we should expect that morphemes with a phonemically strong nasal in one lect also attest a strong nasal in the other lect, and likewise for weak nasals. Twenty of the 33 triggering morphemes attested with target verbs in Gruzdeva (1997) are also found in either Mattissen (2003), in SMNL in environments with target verbs, or both, but only one morpheme's status as phonemically strong or weak fails to be supported by our two comparison sources, namely /eŋ/ 'ski', which is weak (contrary to Gruzdeva's rule, with a fortis-initial target verb) in Gruzdeva's data, as well as in Mattissen (2003), but behaves as a strong nasal in two out of two instances with a target verb in SMNL.

3.3. Historical view of the AN and WSN strong-weak contrast in final nasals with target verbs. The robust evidence of a phonemic contrast between strong and weak final nasals in WSN provided by the data taken from SMNL and analyzed by Luukkonen has allowed us to shed much more light on the disagreeing data from Gruzdeva (1997) and other earlier sources regarding AN.

We see that early sources such as Krejnovich (1937) and others, repeated in Mattissen (2003), report a phonemic strong-weak contrast but provide little data to support it, and we see also that Gruzdeva (1997) provides good data which however do not, *prima facie*, support those earlier descriptions, but rather an alternative one in which no contrast exists. However, we see finally that those data are actually explained best of all as illustrating a partial, ongoing loss of the contrast which was more robust in the earlier twentieth century, and which still exists with excellent regularity in the very closely related WSN lect, developing toward the new AN system which Gruzdeva has already articulated. That is to say, that when Krejnovich, Panfilov, and other earlier sources were acquiring the data upon which they based their descriptions, some eight to ten decades ago, the loss of the strong-weak contrast was probably considerably less advanced than it had become by the time Gruzdeva acquired her data. Thus, those early sources reported a strong-weak contrast which subsequently became obscured (though still integral to the best account of Gruzdeva's data) in AN through an ongoing diachronic development by the time Gruzdeva was working. Meanwhile, the earlier system persists in WSN, perturbed only by the phenomenon of transparent application.

Since the strong-weak contrast with head verbs is robust and regular in WSN, and integral to the best explanation of the data from AN, we hold that it is firmly supported and parsimonious to reconstruct this contrast for Proto-Western Nivkh (the putative last and exclusive common ancestor of AN and WSN, on the basis of shared sound changes — see Halm & Slater, 2018). Some examples of AN and WSN cognates supporting this reconstruction, along with cognates from the other Nivkh lects, are given in Tables 2 through 6 further below. We will take this PWN reconstruction as assumed below in our comparisons with the SSN system.

3.4. The strong-weak contrast in AN and WSN with head nouns. Before moving on from the discussion of the strong-weak contrast in AN and WSN entirely, we should briefly consider the historical status of the contrast in complexes with target nouns. Gruzdeva mentions (1997, p. 87) that Krejnovich (1937) describes variation between strong-type and weak-type triggering behavior in final nasals, not only with target verbs, but also with target nouns. While all the data available to us in both Gruzdeva (1997) and SMNL refute the possibility of such variation existing today, we must keep in mind that Krejnovich was writing over eighty years ago. Unless we are to merely disbelieve and dismiss Krejnovich's reports, the simplest hypothesis is that the strong-weak contrast formerly operated regardless of the syntactic status of the target morpheme, but that a change which had not yet gone to completion across the entire Western Nivkh speech area in the early twentieth century (when Krejnovich was working) subsequently eliminated the contrast before nouns some time before the present day. This hypothesis is made more plausible by the continued attestation of the contrast before bound suffixes (in addition to verbs) in SMNL,[16] as well as because the ongoing leveling of this contrast before verbs in AN suggests a historical drift or trend of change in this direction, and because no such syntactic conditioning of alternation is known in SSN. This, we should note, is also congruent with Gruzdeva's conclusion (1997, p. 94) that at its earliest stage, the system of consonant alternation after nasal triggers, as well as after all other triggering phonemes, was purely phonetic in its inputs, rather than having any syntactic dependency.

[16] Luukkonen (2016, p. 25) actually concludes that initial consonant alternation of target bound suffixes is even more regular and less affected by attritional phenomena than alternation of either nominal or verbal targets. However, we have forgone a detailed examination of the data for suffixial targets from SMNL, both because Luukkonen omits verbal suffixes from his database (2016, pp. 36-39), and because neither Gruzdeva nor any of our other sources discuss the behavior of suffixial targets in AN or any of the other Nivkh varieties beyond a tiny number of incidental examples insufficient for comparison.

4. Segmental considerations

In addition to morphophonemic differences, there are also some segmental changes to final nasals which separate the North Sakhalin, West Sakhalin, and Amur varieties from Proto-Nivkh, and from ESN and SSN, which lack these developments. Specifically, many final velar nasals /*ŋ/ and a much smaller number of final alveolar nasals /*n/ have been elided phonetically in some etyma, although they remain as (silent) triggers of initial consonant alternation, so that AN, WSN, NSN /Øʷ/ <> ESN, SSN /ŋ/, and AN, WSN /Øʷ/ <> NSN, ESN, SSN /n/ in some morphemes, in addition to the correspondences AN, WSN, NSN /ŋ/ <> ESN, SSN /ŋ/ and AN, WSN /n/ <> NSN, ESN, SSN /n/ observed in other morphemes.

At least in the case of the velar deletions, this change is highly regular: a given etymon is either attested with elided /Øʷ/ uniformly across all data in all sources for the three Northwestern varieties, or with unelided /ŋ/ with equal uniformity. To the best of the present authors' knowledge, the entirety of Savel'eva and Taksami (1965; 1970), Gruzdeva (1997; 1998), Mattissen (2003), Shiraishi (2007), Nedjalkov and Otaina (2013); Fortescue (2016), Luukkonen (2016), SMNL, and other familiar sources do not furnish a single instance of the same etymon attested with both /Øʷ/ and /ŋ/ in these lects. Thus, the elision of PN /*ŋ/ > AN, WSN, NSN /Øʷ/ is clearly a closed, historical change, and is best explained as a conditioned regular (i.e. neogrammarian) sound change, in which all instances of the affected Proto-Northwestern Nivkh phoneme in the conditioning environment have undergone the same change, yielding the same outcome, without exceptions, doublets, or other irregularities.

Instances of deleted alveolar /*n/ are far rarer, although they include the ubiquitous nominal plural suffix AN, WSN /-kuØʷ/ <> NSN, ESN /-kun ≈ -kunu/[17] <> SSN /-gun/. Notwithstanding the rarity of elided alveolar nasals, the same regularity of the elision appears to apply, with NSN in this case *not* participating in the change.

It should be pointed out that the lects in which these changes are attested versus unattested also reinforce the interpretation of these elisions as regular sound changes. Halm and Slater (2018) finds evidence in the form of several shared sound changes (centering of /*a, i, u/ > /ə/ before a glide; raising /*a/ > /ə/ in contact with a velar consonant; and the phonetic but not morphophonemic merger of /*w/ > [β] in the syllable onset) that AN, WSN, and NSN form a Northwestern (NWN) clade within the Nivkh family, while other changes shared by AN and WSN but not NSN (/*mx, mχ, ŋq/ > /ŋk/; /*χ/ > /x/ in the coda of a syllable headed by /o/; optional conversion of /*ɣ, ʁ/ to vowel length in /V_C/; and /*n/ > /ɲ/ before a front vowel) show that these two are more closely related to one another than they are to NSN. Hence, we can see the elision of /*ŋ/ as belonging to the first group of sound changes, shared by all three NWN lects, while the elision of /*n/ belongs to the second group of sound changes, affecting only AN and WSN.[18]

While these arguments seem to strongly support the interpretation of these elisions as regular sound changes, this raises another difficulty, since we are then required to determine the conditioning environment for these changes, and as we will see below, the heretofore popular hypothesis of the strong-weak contrast as the conditioning factor is actually not well supported by the data; we will be led instead to an alternative hypothesis.

5. Correlating the segmental and morphophonemic data: conditioning these changes

Although no hypothesis has yet gained acceptance regarding the conditioning environment for the elision of original alveolar nasals /*n/, previous authors (Gruzdeva, 1997, pp. 84-85; Mattissen, 2003, p. 46; Fortescue, 2016, p. 4; as well as others) have asserted that the morphophonemic contrast between strong and weak velars nasals in SSN corresponds to the contrast between elided and non-elided final velar nasals in NWN: i.e., NWN /Øʷ/ <> SSN /ŋʷ/, while NWN /ŋ/ <> SSN /ŋˢ/.

This hypothesis, however, founders upon an inevitable sequence of inferences. If we assume that the strong-weak contrast was the conditioning factor for the elision of /*ŋ/ in NWN, then we must reconstruct such a contrast to PN, and we would be compelled by parsimony to assume that the strong-weak contrasts in both NWN and SSN velars (as well as the elision of weak velars in NWN) directly reflect this PN contrast. Automatically, then, we would assume that all unelided final velars in NWN are morphophonemically strong, since we would predict that all PN weak /*ŋʷ/ would be reflected as NWN /Øʷ/, leaving no source for any modern unelided weak /**ŋʷ/ in NWN. This

[17] The final vowel in the NSN and ESN forms could be historical, but since it is unattested elsewhere in the family, it may reflect interference from the comitative/associative plural suffix, which has the form NSN, ESN /-kunu/ (Gruzdeva, 1998, p. 16; Fortescue, 2016, p. 168).

[18] An anonymous reviewer helpfully points out that the acoustic cues which distinguish a velar nasal coda [ŋ] from an empty coda, especially with a phonetically nasalized vowel, are measurably weaker than the acoustic cues which distinguish the alveolar nasal coda [n], which might suggest an acoustic reason for the velar /*ŋ/ being elided historically earlier than the alveolar /*n/ in these Nivkh lects (Chen 2000).

prediction fails: AN and WSN robustly attest /aŋ$_{W}$/ ‘who?’; /βaŋ$_{W}$/ ‘float, fishing bobber’; /c^{h}əŋ$_{W}$/ ‘you (plural)’; /keŋ$_{W}$/ ‘whale’; /k^{h}eŋ$_{W}$/ ‘sun’; /imŋ$_{W}$/ ‘they’; and /ɲeŋ$_{W}$/ ‘we’, all with unelided weak nasals, confirmed both by SMNL (Luukkonen, 2016) and by Mattissen (2003, pp. 45-46).[19] While some of these, especially the pronouns, might be suspected of irregular developments of some kind, at least three (/keŋ$_{W}$/, /k^{h}eŋ$_{W}$/, and /βaŋ$_{W}$/) have perfectly regular cognates not only in SSN but for that matter also in ESN and NSN (Hattori 1962a, pp. 76, 77, 118; 1962b, pp. 51, 55, 63-71, 79; 1962c, pp. 5, 6; Fortescue, 2016). Likewise, the majority of unelided final alveolar nasals /n/ in WSN and AN are weak,[20] thoroughly belying any hypothesis of the strong-weak contrast as the conditioning factor for the elision /*n/ > /Ø$_{W}$/.

5.1. An alternative conditioning feature for elision. This leaves us in a difficult position: we have seen that elision of /*ŋ/ and /*n/ is highly regular, patterns phylogenetically with other regular sound changes, and gives every appearance of being a pair of conditioned sound changes in the most textbook sense, but we have also seen that the only well-accepted proposal to account for its conditioning is untenable. Unfortunately, obvious alternative hypotheses seeking to condition these elisions on phonological features continued in modern reflexes of affected etyma do not seem promising: consider elided /oɣlaØ$_{W}$/ ‘child’, /eɣaØ$_{W}$/ ‘cow’, and /xeβaØ$_{W}$/ ‘string’ in AN and WSN (all with original PN /*ŋ/, preserved in ESN and SSN cognates) beside unelided AN and WSN /βaŋ$_{W}$/; or elided /-kuØ$_{W}$/ |PL|, /utkuØ$_{W}$/ ‘man’, and /umguØ$_{W}$/ ‘woman’ (all with original PN /*n/) beside unelided /kikun$_{W}$/ ‘eagle-owl’ and /jolun$_{W}$/ ‘footwear’.

Since more attractive options are not supportable, we evidently have no better alternative in light of the evidence than to posit a contrast of some kind in PN which conditioned the elision of /*ŋ/ and /*n/ before disappearing (or at least going entirely unrecorded) in all the modern Nivkh lects. Without any direct phonological evidence for what the nature of this contrast might have been, we can only speculate — whatever notation we choose to represent it will be little more than a placeholder. With this heavy caveat in mind, we will proceed from this point onward by denoting Proto-Nivkh alveolar and velar nasals which are retained in all varieties as though they were phonemically long in PN, /*nː, *ŋː/, and those which are elided as though they were phonemically short in PN, /*ň, *ŋ̌/. Although contrastive length in nasals is known from living languages such as Saami, and a length contrast might be considered a naturally likely factor to condition deletion, we wish to stress once again that this notation should really only be considered an essentially arbitrary placeholder for an as-yet unidentified phonemic contrast of some kind in Proto-Nivkh.

While the hypothesis of contrastively long versus short nasals in PN, or indeed any such phonemic contrast which is entirely unattested in the modern lects, is naturally a very unattractive solution on account of the complete absence of immediate support in the form of a direct reflex of this contrast in the modern varieties, we plan to offer support for the plausibility of *some* such contrast in PN in Halm (*forthcoming*) on the basis of internal reconstruction: the “long” nasals appear to be the reflex of original pre-Proto-Nivkh homorganic nasal-obstruent clusters (strong “long” nasals reflecting pPN nasal-plosive clusters, and “long” weak nasals reflecting pPN nasal-fricative clusters, i.e., velar pPN /*ŋg/ > PN /*ŋːs/, and pPN /*ŋx/ > PN /*ŋːw/, for instance), while “short” nasals reflect originally final pPN nasals; thus, while these clusters were reduced phonetically, they retained their original behavior as triggers of consonant alternation, giving rise in the process to a new phonemic contrast among morpheme-final nasals.[21] Since this hypothesis concerning pre-Proto-Nivkh is outside the scope of the present paper, however, we must limit ourselves to mentioning it briefly, and leave the elaboration of arguments concerning pPN diachronic stages to a future work.

6. Integrating these findings: A Proto-Nivkh system of final nasal phonemes

Now that the historical development of elided nasals and the status of the strong-weak contrast in final nasals in Western Nivkh (i.e., AN and WSN) have been addressed and brought into clearer focus than was once possible, we can turn our attention to the consideration of the Proto-Nivkh system of morpheme-final nasals as a whole.

[19] We might add /nloŋbloŋ-/ ‘to blink’ to this list on the basis of one occurrence in Gruzdeva (1998, p. 54), but this one occurrence constitutes only extremely weak support, and is made more problematic by the difficulty of positively identifying the alternating morpheme which directly follows it there.

[20] Mattissen’s assertion (2003, p. 46) that *all* final /n/ in AN are weak appears to be an exaggeration, since she herself gives one exception, and SMNL furnishes several more, albeit mostly recent borrowings or proper names, as already observed by Luukkonen (2016, pp. 41-42).

[21] In fact, this hypothesis also accounts elegantly for some other related facts, such as the non-assimilation of “long” weak velar nasals, which will be discussed below.

Juxtaposing the strong-weak contrast, the "length" contrast just posited, as well as the assimilating or non-assimilating behavior of the velar nasal, we will look to see whether we can define a phonemic and morphophonemic inventory, with which protoforms can be reconstructed which are adequate to explain attested Nivkh reflexes through a system of regular phonological and morphophonemic changes.

6.1. Proto-Nivkh Velar Final Nasals. As we have seen above, there must have existed at least a three-way contrast of PN velar nasals in morpheme-final position: "long" strong velar nasals /*ŋːS/, which are reflected as strong velar nasals /ŋS/ in both SSN and Western Nivkh (WN); "long" weak nasals /*ŋːW/, which are reflected as strong nasals /ŋS/ in SSN and unelided weak nasals /ŋW/ in WN; and "short" velar nasals /*ŋ̆/, which are reflected as weak nasals /ŋW/ in SSN and as elided final nasals /ØW/ in WN. Examples of etyma which allow us to reconstruct each of these phonemes are given in Tables 2, 3, and 4. Specifically, these tables contain, along with a few other etyma of particular relevance, every etymon which the present authors have been able to locate for which morphophonemic characterization (i.e., characterization as strong versus weak) from both SSN and AN or WSN exists. Although this still amounts to a small corpus — scarcely more than 20 etyma — it demonstrates the very good regularity of these correspondences: as stated above, AN /ØW/ always corresponds to WSN and NSN /ØW/, unelided ESN /ŋ/, and SSN weak /ŋW/; while AN strong /ŋS/ always corresponds to WSN strong /ŋS/, unelided NSN and ESN /ŋ/ and SSN strong /ŋS/; and AN weak but unelided /ŋW/ always corresponds to identical WSN /ŋW/, unelided NSN and ESN /ŋ/, and strong SSN /ŋS/.

Another regularity which is not indicated directly by these tables pertains to assimilation. Hattori (1962a, pp. 76-77 et alibi) indicates that weak /ŋW/ in SSN assimilates its locus to that of a following obstruent across a morphemic boundary, such as in /gəl-a-ŋW/ [gəlaŋ] 'long', but /gəl-a-ŋW-pʰerŋ/ [gəlamperŋ] 'snake' (lit. 'long worm'), while strong /ŋS/ retains its locus in all environments and does not assimilate, e.g. /geŋS-tʰom/ [geŋ̊rom] 'whale fat' (with /tʰ/ » [r̥] due to initial consonant alternation). In the SMNL data presented in Luukkonen's database, neither strong /ŋS/ nor weak /ŋW/ unelided velar nasals ever assimilate in the way which Hattori describes. Since all unelided AN and WSN velar nasals and their corresponding strong /ŋS/ in SSN reflect long PN /*ŋːS/ and /*ŋːW/, we may hypothesize that the non-assimilating behavior of these two phonemes reflects a morphophonemic property inherited directly from these two PN protophonemes. Tentatively, we might hypothesize that the assimilating behavior of SSN weak /ŋW/ might also directly reflect the assimilating behavior of PN short /*ŋ̆/, a behavior obviously unobservable in AN, WSN, and NSN where the reflex of this phoneme is phonetically null /ØW/. In fact, such a hypothesis might offer an advantage in understanding the elision of PN /*ŋ̆/ from a system-internal point of view, since one of the allophones of /ŋW/ in SSN is [Ø] when immediately preceding another velar nasal (Hattori, 1962b, p. 33 et alibi). Thus, the unconditional deletion of this phoneme could have occurred as a gradual widening of the environment for the [Ø] allophone until it completely excluded all the others.

6.2. Proto-Nivkh final labial and palatal nasals. In contrast to the velars and the dentals, there do not appear to be any instances of PN labial or palatal nasals /*m/ or /*ɲ/ elided in any of the Nivkh lects.[22] Hence, we lack any motivation for reconstructing a similar length contrast (although the possibility cannot be excluded that one existed at some period, and was simply lost to merger, either preceding or following the PN stage). On the other hand, the nearly identical environments attested for strong versus weak nasals in /cʰəlmS/ 'palm' versus /kelmW/ 'raspberry' and in /mimS/ 'nasal mucus' versus /tʰomW/ 'fat (n.)' suggest that a conditioned split is less likely as an explanation for the AN strong-weak contrast in the labial than a direct inheritance from PN. Thus, we reconstruct the strong-weak contrast PN /*mS ≠ mW/. If such a reconstructed morphophonemic contrast for this locus in PN is accepted,

[22] Two *prima facie* exceptions to this exist. The first is AN /ŋarm/ <> NSN /ŋajr̥/ <> ESN /ŋajrəm/ 'rib' (Fortescue, 2016). We could interpret this as evidence for a length contrast in PN /*m: ≠ m̆/, with NSN eliding short /*m̆/ and the remaining lects merging it with the reflex of long /m:S/ or /m:W/. But a single etymon, much less a single documentary source for a single etymon, cannot be considered sufficient evidence for such a claim.

The other is the oft-cited etymon AN, WSN, NSN /tuɲ/ <> ESN /tuɲm/ <> SSN /duɲmŋ ≈ tʰuɲimn/ 'finger' (Fortescue, 2016). This lexeme is even more doubtful and problematic than the preceding one, not only since this time AN and WSN appear to have also elided /*m/, but also because ESN appears to have elided /ŋ/, which as we saw above would be irregular, as well as being irregular in the consonant and vowel correspondences in the SSN doublet. The solution may be the identification of this term as a post-PN loan from a Tungusic source; cf. Nanai /t͡sumt͡suən/ 'finger [палец]' (Onenko, 1986).

then we must, *pari passu*, hypothesize that the contrast was lost to unconditional merger in SSN: PN /*m_S, m_W/ > SSN /m_S/, since no trace of the contrast is documented in that lect. We would, therefore, rely exclusively upon AN and WSN data (and perhaps NSN or ESN, if such data surfaces, and these lects have not also lost the contrast), to infer which etyma reflect PN /*m_S/ and which /*m_W/. For the sake of illustration, we may cite a few examples mentioned by Mattissen (2003, pp. 45-46) or attested in Luukkonen (2016) in Table 5. Although these data are quite scarce — indeed, so scarce that they led Luukkonen (2016, p. 57) to declare agnosticism on the existence or non-existence of weak /m_W/ — we can at least see that the strong-weak contrast (or, at least, strong-weak variability) exists in AN etyma with good PN etymologies.

A similar situation pertains to the palatal nasal. There is no trace of the strong-weak contrast in SSN, but also no obvious conditioning environment for a split in AN, so reconstructing PN /*$ɲ_S$ ≠ $ɲ_W$/ should probably be considered more parsimonious, since such a contrast very clearly existed for the velars, and probably for the labials, although the direct evidence from AN reflexes is even scarcer here. Though /me$ɲ_S$/ ‘rudder’ versus /e$ŋ_W$/ ‘ski (n.)’ provides a single near-minimal pair, the fact that the WSN data show /e$ɲ_S$/ in contrast to AN /e$ŋ_W$/ urge caution around any diachronic hypotheses.

6.3. Proto-Nivkh alveolar final nasals. The situation of the alveolar nasals is neither quite the same as that of the velars, where both a “length” contrast and a strong-weak contrast in PN appear securely founded, nor quite the same as that of the labials and palatals, where a strong-weak contrast seems probable but no “length” contrast seems to be justified.

As was described above, some morphemes with PN final /*n/ have clearly elided /*n/ > /$∅_W$/ in AN and WSN (though not NSN), in what appears to be a conditioned sound change, although the affected morphemes are very few, shown in Table 6.

While these morphemes are few, most are relatively common in terms of discourse frequency, and the plural marker in particular is perhaps the single most frequent Nivkh suffix, so whatever our hypothesis regarding the diachronic character of this development, there is more than ample data to support that such elided alveolars are certainly linguistically real, and not merely idiolectal or attritional in nature. Thus, it would appear most parsimonious to hypothesize a length contrast /*n: ≠ ň/ for Proto-Nivkh.

On the other hand, the status of the strong-weak contrast at this locus in PN is somewhat murky. Mattissen (2003, pp. 45-46 et alibi) reports that all final alveolar nasals /n/ are weak in AN, but also gives a single example of a strong alveolar in the bound morpheme /-an/ ‘also’. The SMNL data, meanwhile, actually give copious examples of strong alveolar nasals, as has been pointed out by Luukkonen (2016, pp. 41-42). However, all of these are either anthroponyms (viz.: /ożmun$_S$/, /plagun$_S$/, /xojr$ɲ$an$_S$/, /ŋaɣ$ɲ$un$_S$/) or recent borrowings (/karabin$_S$/ ‘carbine’). In fact, the only weak alveolar nasal in the data in pre-verbal position is the anthroponym /ɸugun$_S$ ≈ ɸugun$_W$ ≈ ɸogun$_S$ ≈ ɸogun$_W$/, which freely varies between strong and weak behavior of its final nasal (as well as in the quality of its first vowel). Shiraishi, whose data (for Shiraishi, 2007 and onward) reflect primarily WSN, gives only meagre support for the existence of weak /n_W/ in WSN, such as the bound morpheme /-n_W-/ which derives nominals referring to persons from verbal phrases (2007, p. 88). Gruzdeva’s (1997) data also fail to shed any light on the status of the contrast, since the only alveolar nasal-final etymon therein, namely /əkən/ ‘brother’, behaves according to Gruzdeva’s syntactic rule (weak before all nouns and lenis-initial verbs, strong before fortis-initial verbs). Like the labials and palatals, the contrast between strong and weak alveolars is absent in SSN (Hattori, 1962b, p. 33 et alibi).

Thus, there are at least two possible interpretations which could easily be considered acceptably compatible with the evidence: either (1) PN featured a strong-weak contrast as well as a “length” contrast in the alveolar nasal, parallel to the velar nasal, which was lost to merger in at least SSN, and is merely poorly represented in the data due to inherited PN etyma having a weak /n_W/ much more commonly that strong /n_S/; or (2) PN did not feature a strong-weak contrast in the alveolar nasal, and a historical morphophonemic change in one or another branch of the family led to all inherited alveolars behaving as strong nasals in SSN but as weak nasals in AN, with WSN perhaps following AN in treating all inherited morphemes as weak, but creating a new phoneme /n_S/ analogically on the basis of the other nasals, and populating this phoneme with loans (including anthroponyms).

Very tentatively, we will prefer to reconstruct the contrast /*n_S ≠ n_W/ for PN, as this may be argued to be more parsimonious, as well as more likely on the basis of yielding a more symmetric system of PN final nasals, but it should be underscored that the evidence for this at present is feeble, and that PN reconstructions lacking this contrast could certainly also be considered reasonable.

PN reconstruction	AN form	WSN form	NSN form	ESN form	SSN form	gloss	sources
*e[χ]aŋ̆[23]	eγa[Øw]		eγa[Øw]	eχaŋ	eχaŋw	'cow'	Hattori, 1962b, pp. 75, 85, et alibi; Savel'eva & Taksami, 1970; Gruzdeva, 1997, p. 84; Fortescue, 2016
*heɻqŋ̆[24]	herq[Øw]	(h)erqØw ≈ herq		heɻqŋw	heɻqŋʔ	'side'	Hattori, 1962b, p. 79; Savel'eva & Taksami, 1970; Gruzdeva, 1998, p. 62; Luukkonen, 2016[25]
*keɻqŋ̆	kerq[Øw]			keɻqŋ	geɻqŋw	'sea'	Hattori, 1962b, pp. 31, 75, 85; 1962c, p. 8; Savel'eva & Taksami, 1970
*kuiφaŋ̆	ku[j]βa[Øw]		ku[j]βi[Øw]		gu[j]φaŋw	'ring, bracelet'	Hattori, 1962b, p. 85; Fortescue, 2016
*murŋ̆[26]	murØw		mur[Øw]	murŋ	murŋw	'horse'	Hattori, 1962b, pp. 61, 72-73, 93; 1962c, p. 19; Gruzdeva, 1997, p. 90; Fortescue, 2016
*ɲixφŋ̆	ɲiβxØw		ɲiβx[Øw]	ɲiβγŋ ≈ ɲiγβŋ	ɲiγβŋw	'human'	Hattori, 1962b, pp. 34, 85; 1962c, p. 10; Gruzdeva, 1997, pp. 85, 90; Fortescue, 2016
*ŋiɻŋ̆	ŋirØw	ŋirØw	ŋir[Øw]	ŋirŋ	ŋirŋw	'cup, bowl'	Hattori, 1962a, pp. 76, 118; Gruzdeva, 1997, pp. 82, 84, 90; Mattissen, 2003, p. 46; Fortescue, 2016; Luukkonen, 2016
*oφaŋ̆	oβa[Øw]	oβaØw	oβa[Øw]	oφaŋ	oφaŋʔ	'flour'	Fortescue, 2016; Luukkonen, 2016
*[o]χlaŋ̆[27]	oγlaØw	oγlaØw ≈ oγla	oγla[Øw] ≈ oʁla[Øw]	eʁlŋ ≈ eχlŋ	eχlŋw	'(one's) child'	Hattori, 1962b, pp. 42, 49, 85, et alibi; 1962c, p. 14; Gruzdeva, 1998, p. 41; Luukkonen, 2016; Fortescue, 2016
*pʰr[o]ŋ̆	pʰroØw			pʰroŋ	pʰɻoŋs ≈ pʰrəŋw	'type of fish'	Hattori, 1962a, p. 76; 1962b, p. 85; 1962c, p. 5; Fortescue, 2016
*pʰuφ(u)ŋ̆	pʰuφØw		pʰuφ[Øw]	pʰuφŋ ≈ pʰuβuŋ	pʰuφŋw	'saw (n.)'	Hattori, 1962a, p. 76; 1962b, p. 34; 1962c, p. 9; Gruzdeva, 1997, p. 87; Mattissen, 2003, p. 46; Fortescue, 2016
*[r]uφŋ̆	ruβ[Øw]		ruφ[Øw]	ruβŋ ≈ tuβŋ	ruβŋw	'patrilineal kin'	Hattori, 1962b, pp. 34, 51, et alibi; 1962c, p. 10; Savel'eva & Taksami, 1970; Fortescue, 2016
*qaŋ̆	qan[Ø]w		qan[Øw]	qaŋ	Gaŋw	'dog'	Hattori, 1962c, p. 25; Gruzdeva, 1997, p. 86; Mattissen, 2003, p. 46; Fortescue, 2016
*ralŋ̆	ralØw		ral[Øw]	ralŋ	ralŋw	'frog'	Hattori, 1962a, pp. 52, 76; Mattissen, 2003, p. 46; Fortescue, 2016
*xeφaŋ̆	xeβa[Øw]			xeβaŋ	xeβaŋw	'string, rope'	Hattori, 1962a, p. 76; Savel'eva & Taksami, 1970
*jaŋ̆(-)[28]	jØw- ~ iØw-	jØw- ~ iØw-		jaŋ	jaŋʔ	|3.OBJ,POSS|, 'he, she'	Shiraishi, 2007, pp. 32, 38-40; Otaina & Nedjalkov, 2013, pp. 13-14; Fortescue, 2016
*-ŋ̆	-Øw			-ŋ	-ŋw	|PARTICIPLE|	Hattori, 1962b, p. 34; 1962c, p. 10; Gruzdeva, 1997; Mattissen, 2003, p. 43; Fortescue, 2016

Table 2: Etyma with Proto-Nivkh final short (weak) velar /*ŋ̆/ (see section 5.1 for the definition of the length contrast)

[23] This form is certainly a Tungusic loan, as Fortescue (2016) and others have pointed out — since the correspondence AN /γ/ <> SSN /χ/ is irregular, it may be the case that this was borrowed independently twice, and actually had not yet been borrowed in PN, so this etymon should be approached with caution.

[24] Since the allophonic rules of voicing for non-initial fricatives appear to differ between the modern Nivkh lects, and a detailed reconstruction of this aspect of PN allophony is beyond the scope of the present paper, we will simply transcribe all non-initial fricatives in our PN reconstructions as voiceless.

[25] Where not otherwise stated, citations to Luukkonen (2016) in this and the following tables are to Luukkonen's database, which is available online or by request from that author.

[26] This etymon is also certainly a loan from Tungusic as has already been pointed out by others (and perhaps indirectly from Mongolic or another language family), and /*qaŋ̆/ may likewise be a loan from Manchu specifically, while Fortescue points out that /*oφaŋ̆/ is also a probable Tungusic loan, but since all sound correspondences in each of these etyma are regular among Nivkh reflexes, they may have been borrowed already in PN. N.B. that the Ul'ch cognate Fortescue proposes for /*oφaŋ̆/ has /p/ corresponding to Nivkh /φ/, which may also indicate a pPN borrowing.

[27] There are several irregularities in the reflexes of this form (the /o/ <> /e/ correspondence, as well as unexplained velar-uvular variation in NSN), so it may have an irregular history, perhaps as a loan. It is included here nevertheless for completeness' sake, because previous work has often assumed cognacy, and morphophonemic data from both sides of the family are available.

[28] Note that this morpheme is probably etymologically distinct from both AN, WSN /iφ/, the independent pronoun, and pPN /*i-/, the family-wide marker of indefinite undergoer on all verbs.

Reconstruction	AN form	NSN form	ESN form	SSN form	other forms	gloss	sources
PWN /*aŋːw/[29]	aŋw				WSN /aŋw/	'who?'	Mattissen, 2003, p. 46; Luukkonen, 2016
PNWN /*cʰəŋːw/	cʰəŋw	cʰiŋ			WSN /cʰəŋw/	'you (PL)'	Mattissen, 2003, p. 46; Gruzdeva, 1997, pp. 86, 90; Fortescue, 2016; Luukkonen, 2016
PWN /*imŋːw/	imŋw				WSN /imŋw/	'they'	Mattissen, 2003, p. 46; Luukkonen, 2016
PN /*keŋːw/	keŋw	keŋ	keŋ	geŋs		'whale'	Hattori, 1962a, p. 76; 1962b, p. 55; 1962c, p. 5; Fortescue, 2016
PN /*kʰeŋːw/	kʰeŋw	kʰeŋ	kʰeŋ	kʰeŋs		'sun'	Hattori 1962a, p. 77; 1962c, p. 5; Fortescue, 2016
PWN /*ɲəŋːw/	ɲəŋw				WSN /ɲəŋw/	'we'	Mattissen, 2003, p. 46; Luukkonen, 2016
PN /*[w]aŋːw/[30]	βaŋw	βaŋ		[β]aŋs	SSN /waŋʔ/	'fishing bobber'	Hattori, 1962a, p. 77; 1962b, pp. 51, 63-71; 1962c, p. 6; Gruzdeva, 1997, p. 90; Fortescue, 2016

Table 3: Etyma with Proto-Nivkh long weak velar /*ŋːw/

Reconstruction	AN form	NSN form	ESN form	SSN form	other forms	gloss	sources
PN /*cʰəŋːsʔ/[31]	cʰəŋs	təŋ	cʰiŋ ≈ ciŋ		WSN /cʰəŋs/	'power, strength'	Gruzdeva, 1997, p. 90; Mattissen, 2003, p. 45; Fortescue, 2016
PN /*haŋːs/	haŋs			haŋs		'hazel grouse'	Hattori, 1962a, p. 76; Mattissen, 2003, p. 45
PN /*loŋːs/	loŋs			loŋs		'moon'	Hattori, 1962a, p. 76; Mattissen, 2003, p. 45
PNWN /*oɤ̥ŋːs/	orŋʔ	orŋ			WSN /orŋs/	'trough, cup'	Savel'eva & Taksami, 1970; Fortescue, 2016; Luukkonen, 2016

Table 4: Etyma with Proto-Nivkh long strong velar /*ŋːs/

[29] Curiously, a large fraction of the Nivkh pronouns do not have reflexes that correspond regularly to one another through known sound correspondences across all the attested lects, and the four pronouns here lack clear ESN or SSN cognates; hence, they may be reconstructable only to Proto-Western or Proto-Northwestern Nivkh, rather than Proto-Nivkh proper.

[30] Although Hattori transcribes SSN initial /β/, and is ordinarily fairly consistent in reporting the /β ≠ w/ contrast, both the /w/ reported in Fortescue (2016), (originally from Takahashi) and the absence of AN alternant forms with initial /**p ~ b/ reported in Savel'eva and Taksami (1970) point to PN /*w/.

[31] There are a number of phonological irregularities among these reflexes, so since there are very plausible Tungusic sources, this etymon may actually reflect several independent instances of post-PN borrowing, rather than a genuine PN etymon.

PN reconstruction	AN form	WSN form	NSN form	ESN form	SSN form	gloss	sources
*cʰ[a]lmS	cʰəlmS		cʰəlm[a][32]	cʰalm	cʰalm	'palm of the hand'	Mattissen, 2003, p. 45; Fortescue, 2016
*mimS	mimS[33]	mimS	mim	mim	mim	'nasal mucus'	Savel'eva & Taksami, 1970; Fortescue, 2016; Luukkonen, 2016
*t[a]mS	təmS		təm	tam		'cranberry'	Mattissen, 2003, p. 45; Fortescue, 2016
*kel(χa)mW	kelmW				gelχam	'raspberry'	Mattissen, 2003, p. 46; Fortescue, 2016
tʰomW	tʰomW		tʰom	tʰom	tʰom	'fat (n.)'	Mattissen, 2003, p. 46; Fortescue, 2016
		jəɣrəmW				'Tengi [toponym]'	Luukkonen, 2016
*meɲS	meɲS	meɲS			meɲ	'rudder'	Mattissen, 2003, p. 45; Fortescue, 2016; Luukkonen, 2016
PNWN /*əɸɲS/	əβɲS		əβɲ			'oar'	Shiraishi, 2000, p. 100; Mattissen, 2003, p. 45; Fortescue, 2016
*χoɲS	χoɲS				χoɲ	'sheep'	Mattissen, 2003, p. 45; Fortescue, 2016
*eɲW	eɲW[34]	eɲS	eɲ		eɲ	'ski'	Savel'eva & Taksami, 1970; Gruzdeva, 1997, p. 91; Mattissen, 2003, p. 46; Fortescue, 2016; Luukkonen, 2016

Table 5: Etyma with Proto-Nivkh labial and palatal nasals

[32] This form is somewhat suspicious, since it would disobey the ordinary rules of Nivkh vowel harmony (Botma, Iosad, & Shiraishi, 2015); the final /a/ may be a mistranscription.

[33] While Savel'eva & Taksami do not directly record the strong-weak distinction, they list a number of compounds with /mim/ which indicate that its final nasal is strong, such as [mim-ɣuż-ɟ] 'to blow one's nose [сморкаться]'; and [mim-żuś] 'handkerchief [носовой платок]', with /kuż-ɟ/ 'to draw out [вытаскивать]' and /żuś/ 'washcloth [мочалка]', respectively (though the latter may be a non-alternating, fricative-initial noun, derived from /żu-/ 'to wash, clean').

[34] Although the SMNL data show /eɲ/ 'ski' behaving as a strong nasal in two of two instances (both from the same speaker), Mattissen is confirmed in her assertion that this etymon behaves as a weak nasal in AN both by Savel'eva & Taksami (1970), who give [eɲ-kʰəż] 'ski pole for skin-covered skis [лыжные палки для камусных лыж]' and Gruzdeva (1997, p. 91), who reports [eɲ-cʰəu-] 'take off skis'. Note that this is a fortis-initial verb, so the trigger is expected to cause a voiceless fricative [**ś] to surface target-initially under Gruzdeva's posited syntax-based system of nasal alternation, so we cannot attribute the weak character of the nasal in this etymon to any of the recent diachronic changes in AN which we have discussed above.

PN reconstruction	AN form	WSN form	NSN form	ESN form	SSN form	gloss	sources
*-ka[t]n[35]	-kar[$Ø_W$]		-kaɽ̥[$Ø_W$?]	-katn		|INTENSE QUALITY| or |ELATIVE|	Gruzdeva, 1998, p. 30; Fortescue, 2016
*-kun	-ku$Ø_W$	-ku$Ø_W$ ≈ -ku	-kun ≈ -kunu	-kun	-gun	|PLURAL|	Hattori, 1962a, p. 103 et alibi; Gruzdeva, 1997, p. 85; 1998, p. 11; Mattissen, 2003, p. 46; Fortescue, 2016; Luukkonen, 2016
*-k[i]n	-ke$Ø_W$	-ke	-kin	-kin	-gin	|DUAL COMITATIVE|	Hattori, 1962a, p. 103 et alibi; Gruzdeva, 1997, p. 85; 1998, p. 17; Mattissen, 2003, p. 46; Fortescue, 2016; Luukkonen, 2016
*-k[u]n(u)	-ko$Ø_W$		-kunu	-kunu	-gun	|PLURAL COMITATIVE|	Gruzdeva, 1997, p. 85; 1998, p. 17; Mattissen, 2003, p. 46; Fortescue, 2016
*q^haɽ̥pn	q^harp[$Ø_W$]			q^haɽ̥pn		'hoof'	Savel'eva & Taksami, 1970; Fortescue, 2016
*umgun	umgu$Ø_W$	umgu$Ø_W$ ≈ umgu	[umgun][36]			'woman, wife'	Mattissen, 2003, pp. 42, 46; Fortescue, 2016; Luukkonen, 2016
*utkun	utku$Ø_W$	utku$Ø_W$	utkun			'man, husband'	Mattissen, 2003, pp. 42, 46; Fortescue, 2016; Luukkonen, 2016

Table 6: Etyma with elided Proto-Nivkh alveolar /*n/

[35] This form is somewhat problematic, not only because of the unexpected AN, WSN, NSN /r/ <> ESN, SSN /t/ correspondence, but also because in this case NSN seems to have also elided the alveolar nasal, which bucks the trend of the remaining morphemes. Note also NgN /-qatŋ ≈ -kaɽ̥/ |id.|, which shows further irregularities. It may be that this morpheme represents parallel derivation of some kind within the language family postdating PN.

[36] Mattissen (2003, p. 42) states that there is a reported cognate of AN, WSN /umgu$Ø_w$/ with a final alveolar nasal, but we have been unable to find a first-hand report of such a form.

6.4. The Proto-Nivkh inventory of nasal phonemes in morpheme-final position. The conclusions drawn above leave us with the system of PN morpheme-final nasals shown below in Table 7. In addition to the strong-weak morphophonemic contrast which survives in WSN before verbs and in SSN only for the velar nasal, and the "length" contrast which we infer as the conditioning factor for elision in AN, WSN, and NSN, we can also reconstruct a phenomenon of place assimilation for only the short velar nasal /*ŋ̆/ in Proto-Nivkh, as mentioned above.

	labial	palatal	alveolar	velar	
weak	*mw	*ɲw	*n̆	*ŋ̆	"short" (weak)
			*n:w	*ŋ:w	"long" weak
strong	*ms	*ɲs	*n:s	*ŋ:s	"long" strong

Table 7: Reconstructed inventory of Proto-Nivkh nasal phonemes in morpheme-final position.

6.5. Diachronic developments from Proto-Nivkh to the modern lects. At this point, we can also summarize the diachronic developments which the available evidence has led us to. In SSN, all the contrasts in the non-velar nasals were leveled both phonetically and morphophonemically, so that all non-velar final nasals behave like the original strong nasals. Meanwhile the original long weak velar nasal merged in SSN into the strong velar nasal, PN /*ŋ:w, ŋ:s/ > SSN /ŋs/, while the original short velar nasal remained distinct in both its morphophonemic triggering behavior and in that it continued to display allophonic place assimilation across the morpheme boundary in syntactic complexes. In fact, we might conjecture that the distinctive assimilating allophonic behavior of short velar /*ŋ̆/ in PN played a role in allowing it to avoid the merger in SSN which affected the other nasals, perhaps by providing speakers with a second system of cues in the acquisition of the distinction /*ŋ̆ ≠ ŋ:s, ŋ:w/ in the lexicon, which was not available to reinforce acquisition of the morphophonemic contrasts at the other three loci.

In Proto-Northwestern Nivkh (the exclusive common ancestor of AN, WSN, and NSN), meanwhile, original short velar /*ŋ̆/ was phonetically elided to /*Øw/ while retaining its morphophonemic triggering behavior as a weak nasal. Subsequent to breakup of PNWN into NSN and Proto-Western Nivkh (the common ancestor of AN and WSN alone), original short alveolar /*n̆/ was also elided in the latter, merging into /*Øw/. Subsequent to this,[37] both AN and WSN leveled the strong-weak distinction (regardless of locus) in syntactic complexes with nominal targets — a change which was still ongoing in the early twentieth century. Finally, beginning in the mid or late twentieth century, AN alone has begun to extend this levelling to syntactic complexes with verb targets; although this change had not gone to completion by the last decade of the twentieth century, it is unclear whether this represents incomplete lexical diffusion, individual variation, or some other form of variability.

It must also be pointed out that there remains a great deal which we do not at this time know regarding the trajectory of diachronic changes, and to a certain extent even about the PN system, given the evidence which is currently available to us. We have no idea what changes if any have affected the systems of final nasals in ESN or its modern, koineized relative NgN, apart from the fact that the former regularly and the latter generally fails to show elision of the original short nasals /*n̆, ŋ̆/, and we likewise know nothing of the NSN system other than that it apparently regularly elides velar /*ŋ̆/ but not alveolar /*n̆/. At least some room for doubt remains as to whether PN actually had a strong-weak contrast in the palatal nasal /*ɲw ≠ ɲs/, and much more doubt exists regarding the

[37] This stage might perhaps still be identified with PWN or "Common Western Nivkh," since we have no absolute dating of the only other sound change which — if it is not a purely orthographic artifact — distinguishes AN from WSN (merger of alveolar plosives into the palatals before front vowels). Such an interpretation would be nomenclaturally awkward, since it might force us to identify some of the early twentieth-century records of "Amur Nivkh" as more strictly Common Western Nivkh. We can avoid this issue by supposing that the morphophonemic leveling of the strong-weak contrast in syntactic complexes with nominal targets spread in a wave-like fashion postdating the initial separation of PWN into AN and WSN, but there is no reliable positive evidence for this, since the other change in question is very hard to distinguish from subphonemic palatalization in Cyrillic transcriptions.

corresponding contrast for the alveolars /*n:$_W$ ≠ n:$_S$/, as well as over what developments if any have affected the /*n:$_W$ ≠ n:$_S$/ contrast in WSN or AN since PN times.

7. Conclusions

Despite the doubts and gaps which we have just enumerated, even the partial and fragmentary portion of the theory developed above which rests on relatively firm evidence — the three-way contrast between velar /*ŋ̆ ≠ ŋ:$_W$ ≠ ŋ:$_S$/ in PN; the necessity for some contrast, which we provisionally refer to as "length," distinct from the strong-weak contrast to condition elision; and the contrast in allophonic behavior between assimilating short /*ŋ̆/ and non-assimilating long /*ŋ:$_W$, ŋ:$_S$/ — represents a major development in our understanding of the Proto-Nivkh antecedent to this most perplexing and intractable web of segmental and morphophonemic phenomena, made possible by the addition of excellent and critical recent work (above all the work of Luukkonen and of Shiraishi, Lok, Liutova, and others in the form of the Sound Materials of the Nivkh Language archive) to much high-quality and tireless work before it.

Nevertheless, as discussed above there obviously remains much to be clarified about both the modern and Proto-Nivkh systems of final nasals, and there is a serious need for a greater quantity of high-quality data to be applied to placing on a firmer evidentiary footing what has been shown tenuously thus far, or else to exposing its errors and replacing it with a better supported system of hypotheses. Such data are especially needed from three domains: primary description of the North Sakhalin and East Sakhalin lects, which are underrepresented in existing materials relative to AN, WSN, and SSN; philological studies of existing Nivkh literature and writings, such as the newspaper *Nivkh Dif* or the folkloric-literary works of Vladimir Sangi, which are not easily available in the West, in order to expand our data on both the better and more poorly described lects; and the analysis of loans between Nivkh and unrelated regional languages as a means of understanding diachronic developments — "external reconstruction", according to the term coined by Janhunen (2016). Work of this kind will lay the foundation for and buttress the tenuous extensions of the Standard Comparative Method and internal reconstruction.

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