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Variation of Consonant Mutation in Nivkh

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| Tiivistelmä – Referat – Abstract | | | |
| <p>Nivhin kieli on Venäjän Kaukoidässä puhuttava isolaattikieli. Kieli on vakavasti uhanalainen, eikä se enää siirry lapsille. Arviot nykyisestä puhujamäärästä vaihtelevat joistakin kymmenistä satoihin.</p> <p>Tutkielmassa kartoitettiin nivhin kielelle ominaista alkukonsonanttien alternaatiota (<i>Consonant Mutation</i>) ja siinä esiintyvää vaihtelua. Alternaatio tapahtuu samapaikkaisten klusiilien ja frikatiivien välillä, esim. <i>cus pəŋx</i> 'lihakeitto' mutta <i>č'o vəŋx</i> 'kalakeitto'. Fonologisen ympäristön lisäksi alternaatio vaatii tietyn morfosyntaktisen kontekstin.</p> <p>Tutkimuksen tarkoituksena oli selvittää alternaation säännönmukaisuutta nykyisten nivhin puhujien kielessä. Omien kenttätutkimustietojeni perusteella oli syytä epäillä, että nykyisillä puhujilla alternaatiot eivät toteudu yhtä johdonmukaisesti kuin kirjallisuudessa on tavallisesti esitetty. Tukea tälle hypoteesille oli löydettävissä kelttiläisten kielten vastaavankaltaisissa alternaatioissa havaitusta kehityksestä kielen käytön vähentyessä. Lisäksi oli ennalta tiedossa, että resonanttien jälkeisessä ympäristössä alternaatioissa on runsaasti vaihtelua.</p> <p>Aineistona oli kahdeksan vuosina 2002–2013 ilmestynyttä <i>Sound Materials of the Nivkh Language</i> -sarjan julkaisua, jotka sisälsivät yhteensä noin viisi ja puoli tuntia nivhinkielisiä keskusteluja transkriptioineen. Näistä poimittiin kaikkiaan yli 2 300 konsonanttialternaatiokontekstia, jotka tallennettiin tietokantaan laajempaa tarkastelua varten. Alternaation toteutumista vertailtiin puhujakohtaisesti, erilaisissa syntaktisissa rakenteissa ja eri äänneiden välillä.</p> <p>Tutkimus vahvistaa resonanttien jälkeisen alternaation heikon ennustettavuuden. Muissa tapauksissa yleisten sääntöjen vastaisia muotoja oli vajaat 7 prosenttia, joista osalle löytyi mahdollisia selittäviä tekijöitä, kuten leksikaalisia poikkeuksia. Vaille selitystä tapauksista jäivät sen verran harvat, että niiden osalta pienessä, normittamattomassa kielessä esiintyvää luontaista variaatiota voidaan pitää todennäköisempänä selittävänä tekijänä kuin kielen attritiota, vaikka nuorimpien puhujien kohdalla tätäkään ei voida sulkea pois.</p> | | | |
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Contents

| | |
|--|-----------|
| 1. Introduction | 1 |
| 2. The Nivkh language | 3 |
| 2.1. General characteristics | 3 |
| 2.2. Earlier research | 4 |
| 2.3. Dialects and sociolinguistics | 5 |
| 2.4. Phonological structure of Nivkh | 9 |
| 2.5. Linguistic attrition in Nivkh | 12 |
| 3. Consonant Mutation | 13 |
| 3.1. Typological background | 13 |
| 3.2. Consonant Mutation in Nivkh | 15 |
| 3.3. Comparison with other languages | 20 |
| 3.3.1. Initial consonant mutations in other languages | 20 |
| 3.3.2. Attrition in Celtic ICM | 22 |
| 3.4. Attested variation in Nivkh Consonant Mutation | 23 |
| 3.5. Fieldwork findings | 25 |
| 4. Method and data | 27 |
| 4.1. The series <i>Sound Materials of the Nivkh Language</i> | 27 |
| 4.2. Database | 30 |
| 4.2.1. Structure and principles of the database | 30 |
| 4.2.2. Collecting syntactic complexes | 35 |
| 4.2.3. Collecting suffixes and postpositions | 36 |
| 4.3. Analysis | 39 |
| 5. Results | 41 |
| 5.1. Post-sonorant variation | 41 |
| 5.2. Variation in case of loanwords | 44 |
| 5.3. Other types of variation | 47 |
| 5.4. Differences between construction types | 53 |
| 5.5. Differences between speakers | 54 |
| 5.6. Sound-specific differences | 55 |

| | |
|---------------------------------------|-----------|
| 6. Discussion | 58 |
| 6.1. Summary of the results | 58 |
| 6.2. Concluding remarks | 61 |
| Abbreviations | 63 |
| Excerpt from the database | 64 |
| Transcription | 65 |
| References | 66 |

1. Introduction

In this paper I will take a look at the morpheme-initial alternation of plosives and fricatives in the Northeast Asian language isolate Nivkh. The phenomenon, known as Consonant Mutation (CM), changes initial plosives to homorganic fricatives, or vice versa, in certain phonologically and grammatically determined environments: e.g. *təf* ‘house’ but *ŋa + rəf* ‘animal’s house’; *roʃ* ‘to help’ but *hemar + toʃ* ‘to help the old man’ (Nedjalkov & Otaina 2013: 5). The topic caught my attention as I participated in a field trip to the island of Sakhalin in the summer of 2014. I realised that observing CM in the field could match my interests in phonology. Moreover, I was told that in the current sociolinguistic circumstances, the phenomenon could be losing its productivity. My results from elicitation indicated that this really was the case, especially (but not exclusively) among the youngest speakers. To see whether this development really was recent or not, I needed to turn to previously recorded, more elaborate samples of Nivkh language use. A natural choice for this was *Sound Materials of the Nivkh Language* (SMNL) by Shiraishi & Lok. The archive consists of 11 books and recordings published between 2002 and 2014. Of these I selected eight volumes, consisting of five and a half hours of recorded material transcribed to 440 pages.

The main objective of the study is to determine the present (or near-present) state of CM using the data from SMNL. At the same time, I would also get answers to more specific questions, such as:

- is CM more systematic in conversation than in elicited phrases?
- CM is observed in different syntactic constructions (roughly, we can identify three major types). Do some of them preserve CM better than others?
- what kind of differences are attested between speakers? Are the differences just free idiolectal variation or could there be other factors?
- are there sound-specific differences?

Among the world’s languages, Nivkh belongs to the unfortunate majority which is at risk of going extinct in the foreseeable future. This naturally means that descriptive research on the language should be conducted now

that it is still possible with native speakers, and this is especially important when studying phonology. Another viewpoint is that language obsolescence and its implications are an interesting field of research as such. While the growing inconsistency in Consonant Mutation is recognised, the details and tendencies involved have not been really documented yet. This study aims to contribute to this documentation at least on a tentative level.

The thesis begins with introduction to the Nivkh language (section 2), starting from its typological properties and areal connections (2.1), as well as research history (2.2). Section 2.3 takes a brief look at dialectal variation in Nivkh and describes the sociolinguistic setting of the language in recent history and today. From this I will move on to phonology, describing the phoneme inventory of Nivkh in section 2.4. Section 2.5 deals with loss of linguistic complexity, known as *attrition*, explaining in which ways it usually shows up in moribund languages and how it has been attested in Nivkh.

Section 3 is devoted to Consonant Mutation, starting with the general typological background of the process (3.1). After that, I present the rules of CM (3.2) along with numerous elucidating examples from literature. I do not intend to view CM from the perspective of any specific phonological theory or approach. However, I will resort to simple theoretical concepts, such as distinctive features, in contexts where their explanatory power can be easily utilised. For typological comparison, similar phonological phenomena in the world's languages, especially in Celtic languages, are presented in the following section 3.3. Section 3.4 discusses internal variation observed so far in CM, which is then exemplified in 3.5 by the fieldwork data which originally motivated me to pick this topic for a thesis.

In section 4 I describe my data and methodology. First (in 4.1), I present the format and contents of *Sound Materials of the Nivkh Language*. This material was scanned for CM contexts, which were saved to a database along with metadata such as speaker, expected phonological realisation and syntactic structure type. The architecture of the database as well as the principles and restrictions of gathering data into it are thoroughly explained in 4.2, followed by a description of how the database was utilised for both retrieving quantitative data and selecting examples of atypical CM (4.3).

The results are presented in section 5. Variation in CM is first examined in its two major contexts of occurrence: after sonorants (5.1) and in contact with loanwords (5.2). These are followed by unexpected cases of CM

(5.3), in which various interesting examples are listed, with explanations proposed where they can be found. In the following sections (5.4, 5.5, 5.6) database tools are used for sorting and grouping the amassed data to see if the variation in CM correlates with type of construction, speaker, or the alternating sounds.

Finally, section 6 sums up the results and examines them in the light of the attrition hypothesis and other explaining factors, giving answers to research questions set up above (6.1). Strengths and weaknesses of the methods used are evaluated as well, and some ideas for future research are suggested (6.2).

I wish to express my gratitude to Hidetoshi Shiraishi who introduced me to SMNL. I also want to thank all the Nivkh speakers I had the pleasure to meet during my visit to Sakhalin.

2. The Nivkh language

2.1. General characteristics

Nivkh is the name of an indigenous ethnic group of the Russian Far East as well as their language, spoken on the island of Sakhalin and in the Amur region of the adjacent Russian mainland. The Nivkh language is usually included in the areally based group of Paleosiberian languages. Genealogically it is considered a language isolate, despite efforts to link it with other languages in its geographical vicinity. The ethnonym Nivkh ('man, human being' in the Nivkh language) has been in international use since the 1930's when it replaced the previously used Tungusic-derived *Gilyak*, as a part of the Soviet policy to switch to endonymic terms for indigenous peoples and their languages. (Gruzdeva 1998: 5, Shiraishi 2006: 1)

Typologically, Nivkh has parallels in other languages of Northern Eurasia, having agglutinating suffixal morphology with polysynthetic features. Before Russian, Nivkh has been in contact with Ainu and Tungusic tribes such as Uilta and Evenki, which has resulted in abundance of loanwords and phonetic interference. The influence has been rather unidirectional; Nivkh has had little effect on its neighbouring languages. (Austerlitz 1994, Gruzdeva 1998: 8)

There are no adjectives as a syntactic class; intransitive qualitative verbs are used instead. In verbal morphology, there are more than 20 converbs. Sequences of events are often expressed by a chain of converbs which is terminated by a finite predicate. The canonical constituent order is subject-object-verb. (Nedjalkov & Otaina 2013: 1) The object and the verb form a particularly close unit; in Mattissen’s (2003) terms, the object *synthesises* to the verb. In case of ditransitive verbs, this applies to the recipient/goal participant, and not the theme (or patient) which in many languages is both the monotransitive and ditransitive “direct object” (Mattissen 2003: 140–147). For languages with a Nivkh-like encoding pattern, Dryer (1986) uses the term *primary object* for the object-marked argument. I will adopt the concept for this study as well, and also “object” refers to the primary object if not indicated otherwise.

The phonological system of Nivkh is presented in detail in section 2.4. Here it suffices to say that the inventory of six vowels is fairly similar to that of Tungusic languages, consisting of three height-based harmonic pairs. The vowel harmony is not, though, very transparent in modern Nivkh. The consonant inventory, on the other hand, is considerably larger than in the neighbouring languages. (Janhunen, forthcoming)

2.2. Earlier research

The oldest records on people identifiable as Nivkh or Gilyak are from Chinese chronicles under the Yuan dynasty (1271–1341), where these people were called *Chi-li-mi* or *Ch’i-lieh-mi*. The Russians came into contact with the Gilyak as a result of their conquest of the Far East in the 16th century; their first ethnographic observations are from the middle of the century. After a few decades Western and Japanese explorers followed, but the Nivkh language remained undocumented. Notes about the language were collected starting from the 19th century, but as the people writing those were not linguists, the word lists were often brief, inaccurate and occasionally in indigenous languages other than Nivkh. (Krejnovich 1937, Jakobson 1957: 72–77)

At the turn of the 20th century, the Nivkh people were studied by Lev Iakovlevich Shternberg and Bronisław Piłsudski, who were sent to political exile to Sakhalin from the western parts of the Russian Empire. They worked mainly as ethnographers but also documented vocabulary and col-

lected texts in Nivkh. Unfortunately, Shternberg collected stories from his consultants word by word with pauses in between, which left some details of the language such as the phonological laws of Consonant Mutation unrevealed (Jakobson 1957: 77).

These shortcomings were amended in the 1930's by E. A. Krejnovich, who not only wrote linguistically accurate descriptions of the Nivkh language but also participated in creation of a literary language for Amur Nivkh (Jakobson 1957: 76–77). After World War II the language has been studied by Robert Austerlitz, V. Z. Panfilov, and Takeshi Hattori, to name a few. Of native speakers of Nivkh who have distinguished themselves as linguists and documenters of the language, one must mention Galina Otaina (1930–1995) and Chuner Taksami (1931–2014). Lately, phonology and grammar of Nivkh have been examined by Ekaterina Gruzdeva (1997a, 1998) and Hidetoshi Shiraishi (2000, 2006), whose expertise has been very valuable for my study.

2.3. Dialects and sociolinguistics

The main dialectal division in Nivkh is between the Amur dialect group and the Sakhalin dialect group. The Amur varieties were historically spoken in Continental Amur Region, but also on the northwestern coast of Sakhalin and on the Schmidt peninsula, the northernmost tip of the island. The Sakhalin varieties were concentrated on the eastern coast of the island (where now is the town of Nogliki) and the southeastern regions around the town of Poronaisk (Shiraishi 2006: 10–12).

Gruzdeva (1998: 7) lists four dialects: the Amur dialect (hereafter AD), the East Sakhalin dialect (ESD), the North Sakhalin dialect (NSD) and the South Sakhalin dialect (SSD). In terms of the binary division, AD and NSD belong to Amur group while ESD and SSD constitute the Sakhalin group. In addition to these, Shiraishi (2006) distinguishes the West Sakhalin dialect (WSD), which is closely related to the continental Amur dialect (thus belonging to the Amur group) but spoken on the northwestern coast of Sakhalin. Most of the Nivkh villages of Western Sakhalin and Schmidt Peninsula no longer exist and the speakers have been resettled in other villages and urban localities on Sakhalin. This has blurred the geographical borders of dialects but the linguistic differences between Amur and Sakhalin varieties are still clear: these two are different enough to make their speakers unable to un-

derstand each other without difficulties. Today, the AD-ESD dichotomy is further reinforced by the fact that SSD and NSD are virtually extinct.

Most of the limited literary use of Nivkh, such as the newspaper *Nivkh Dif* and primers for schoolchildren, are in Amur dialects but material in ESD exists as well. Linguistic descriptions exist for all dialects but emphasis seems to be on AD (including WSD) which is spoken by the majority of the Nivkh people. As the southern half of Sakhalin belonged to Japan until the end of the World War II and its population was evacuated to Hokkaido after it, SSD has been described by Japanese scholars, such as Hattori (1962), as well as western researches (e.g. Robert Austerlitz) who were denied access to Sakhalin during the Soviet period.

Nivkh language and culture are taught in kindergartens and in the lower grades of elementary schools in the villages of Chir-Unvd on central Sakhalin and Kal'ma in the Amur region, as well in a “language circle for interested children” in Nekrasovka, northwestern Sakhalin (H. Shiraishi p.c.), but this is not enough to raise fluent speakers. The teachers, while ethnically Nivkh, are not always first-language speakers of Nivkh, and the language is of little use for the children outside these lessons. Despite the general fairly positive ethnic self-identification as Nivkh, the language will continue to phase out unless serious revitalisation measures are urgently taken. (Shiraishi 2006: 11–14)

The Nivkh community is undergoing (or has largely undergone) a language shift, which is how most threatened languages gradually die out (see e.g. Thomason 2001). Often the process takes just three generations: the monolingual speakers of minority language (who may know the majority language as well, but not at native proficiency) raise bilingual children who do not pass the ancestral language on to their children, who then become monolingual in the dominant language.

After World War II, Russian-only boarding schools and forced resettling of villages have been disastrous to intergenerational transmission of the language. While the ethnic population has remained stable or even slightly increased during past decades (from around 4000 before 1945 to 4420 according to 1979 Soviet census and 4650 in 2010 Russian census), the number of speakers has plummeted: in the 2010 census, only 198 speakers remained (Shiraishi & Botma 2015, Lewis et al. 2015). Nowadays, the youngest fluent speakers are from 40 to 60 years old, depending on the criteria for fluency.

All speakers are bilingual in Russian, which is the main language of their everyday interaction.

The resulting situation, where the language is not actively used any more despite still having native speakers left, is called *language obsolescence*. At this point, the proficiency among the remaining speakers varies greatly from fully fluent speakers to *rememberers* who only know some lexical items or fixed expressions, typically phonetically adapted to their native (dominant) language (Campbell & Muntzel 1989: 181–183). An intermediate group are *semi-speakers* who either have learnt the language imperfectly or have once been competent speakers but lost their fluency due to lack of use. This includes many of the current speakers of Nivkh, whose exposure to the language was interrupted in the boarding school environment. Aikhenvald (2012) reminds that the influence of a dominant culture and, consequently, decline of the traditional language may already have started before linguists arrived. The speakers we now treat as “fluent” might already have acquired an obsolescent variety of the language, and indeed, grammars for many extinct languages are based on material from a few last speakers, whose language has inevitably been different from the “untouched” variety once spoken in the community. In case of Nivkh, we are lucky to have access to Krejnovich’s work from the interwar period when the language was still transmitted to children.

Various systems have been devised for measuring and categorizing language vitality. *Ethnologue* uses Expanded Graded Intergenerational Disruption Scale (EGIDS) ranging from 0 (internationally used) to 10 (extinct). Nivkh is assigned level 8a (moribund), which means that “*the only remaining active users of the language are members of the grandparent generation and older*”. Given the rate the speakers pass away, leaving remaining speakers scattered (most of the speakers who have contributed to SMNL are already gone), the current situation of the language today perhaps already corresponds to level 8b (nearly extinct: “*the only remaining users of the language are members of the grandparent generation or older who have little opportunity to use the language*”). (Lewis et al. 2015)

In the following conversation (1) in Russian between speakers ON (born 1915, 89 years old at the time of the interview) and GL (born 1946) the difference of generations shows:

- (1) GL: *tvoja babufka?*
 your.F grandmother
 ‘Your grandmother?’
- ON: *tvoja babuska, deduska...*
 your.F grandmother grandfather
 ‘Your grandmother, grandfather...’

(Shiraishi & Lok 2012: 36)

We can see that ON does not palatalise the initial /d/ in *dedufka*, and replaces the palatal (or retroflex) sibilant /ʃ/ (which does not exist in Nivkh) with plain /s/. She is essentially transferring Nivkh phonology to her Russian, while younger speakers tend to do the other way round: Shiraishi (2006: 23–24) reports that when speaking Nivkh, many modern speakers often automatically palatalise consonants followed by /i/ or /e/, on the model of Russian.¹ This is illustrated in a dialogue between ON and VI (born 1946):

- (2) VI (asking in Russian): *voronə, voronə, kak kak?*
 crows how
 ‘How do you say crows (in Nivkh)?’
- ON: *ves, ves.*
 crow
 ‘Ves, ves.’
- VI: *v^hes-ku la?*
 crow-PL Q
 ‘Ves, right?’

(Shiraishi 2006: 23–24, from Shiraishi & Lok 2003: 43)

ON probably represented the last generation of Nivkh speakers who was not fully bilingual; modern speakers hardly deviate from the standard Russian pronunciation of /ʃ/ [ʃ ~ ʂ].

¹In this study, secondary palatalisation like this is not indicated in transcription apart from this example (2).

2.4. Phonological structure of Nivkh

Table 1 shows the vowel inventory of Nivkh. All vowels tend to be slightly centralised in comparison with corresponding cardinal vowels. The vowel /ə/ is written in the official Cyrillic alphabet as <ы> and could, as its phonetic height may vary, be transcribed also as /i/. Some transcriptions also use /y/ (probably because it is a common way to transliterate Russian <ы>) which is a bit misleading as the vowel is not rounded.

Vowel length is originally not phonemic, but in AD, fricatives /ɣ/ and /ʁ/ are deleted in some preconsonantal positions, leaving the preceding vowel compensatorily lengthened. This may result in minimal pairs like *ηa:s* (< ηays) ‘wall’ vs. *ηas* ‘strap’ (Panfilov 1962: 12). Yet, Mattissen (2003: 36–37) sees the presence or absence of the fricative as free variation, and Shiraishi (2006: 22) considers fricative deletion a fast-speech rule which does not occur in careful pronunciation. In transcriptions of SMNL, the fricative is preserved, be it clearly audible or not.

Table 1: The vowel system of Nivkh (adapted from Gruzdeva 1998: 10)

| | <i>front</i> | <i>central</i> | <i>back</i> |
|---------------|--------------|----------------|-------------|
| <i>high</i> | i | | u |
| <i>middle</i> | e | ə | o |
| <i>low</i> | | a | |

The consonant system (Table 2) is elaborate, containing up to 33 distinct sounds. There are three series of plosives: aspirated voiceless, non-aspirated voiceless and non-aspirated voiced. Some of the plosives, especially the palatal ones, are occasionally described as affricates (e.g. Mattissen 2003: 35).

The fricative inventory consists of eight phonemes: a pair of voiced and voiceless segment for four places of articulation. The sibilants /s/ and /z/ could also be interpreted as dental, but they are often more or less palatalised and in phonological processes such as CM they behave like palatals.

The opposition of uvular and velar obstruents is marginal; they only contrast in word-final position. Otherwise, uvulars /q^h q ɢ ʁ χ/ appear before vowels /a/ and /o/ whereas velars /k^h k g ɣ x/ precede other vowels /i e ə u/. It seems that even this uvular-velar contrast is currently being

Table 2: The consonant system of Nivkh (adapted from Gruzdeva 1998: 10, Shiraishi 2006: 24)

| | | | | | |
|-----------------------------|----------------|----------------|----------------|----------------|----------------|
| <i>aspirated plosives</i> | p ^h | t ^h | c ^h | k ^h | q ^h |
| <i>voiceless plosives</i> | p | t | c | k | q |
| <i>voiced plosives</i> | b | d | ɟ | g | ŋ |
| <i>nasals</i> | m | n | ɲ | ŋ | |
| <i>voiced fricatives</i> | | v | z | ʝ | ʙ |
| <i>voiceless fricatives</i> | | f | s | x | χ |
| <i>lateral</i> | | | l | | |
| <i>voiceless trill</i> | | | ɾ̥ | | |
| <i>voiced trill</i> | | | r | | |
| <i>glides</i> | (w) | | j | | h |

neutralised, possibly due to influence from Russian, which has no uvulars (Gruzdeva 2015a).

Phonetically, there are three liquids: the lateral approximant /l/ and trills /r/ and /ɾ/.² The trills, however, should functionally be seen as fricatives: they include a voiced and a voiceless segment (no sonorant in Nivkh is voiceless), they exhibit laryngeal phonology similar to true fricatives and, crucially, participate in CM with the plosives /t/ and /t^h/, occupying the slot of dental fricatives, the relevant sibilants being palatal as mentioned above (Shiraishi 2006: 26–27). The glide /h/ is articulatorily weak and only appears in initial positions. Other glides are /j/, which always appears prevocally, and /w/. In Amur dialect group /w/ has been lost as a result of merger with /v/, and seems to be losing its phonemic status in East Sakhalin dialect as well (E. Gruzdeva p.c.).

There are four nasal consonants, which can be contrasted in all positions. Unlike in many languages, they do not place-assimilate to the following consonant (e.g. *təm̩k* ‘hand’, *ŋəŋf* ‘bone’; Shiraishi 2006: 27). From the CM point of view, nasals are particularly interesting for two reasons: firstly, voiced plosives are attested after nasals (and after /l/), and secondly, alternations in post-nasal contexts are often unpredictable (cf. Gruzdeva 1997a). Furthermore, many word-final nasals have elided in the Amur dialects, re-

²To be precise, the description of /ɾ/ as a trill holds for AD/WSD. In NSD it has derhoticised to [ʃ], and the ESD pronunciation is [rʃ]. (Gruzdeva 2015b)

sulting in synchronic morphophonological opacity. This is discussed in detail in section 3.2.

The phonemic status of voiced plosives is debated; some authors such as Shiraishi (2006) and Blevins (1993) regard them as allophones of their voiceless non-aspirated counterparts. /g/ only occurs as a result of Consonant Mutation of /k/ and /q/, meaning that it is not part of the citation form of any lexeme. Voiced plosives do not occur word-initially except for /b d g/ in Russian loanwords and some ideophones (e.g. *goŋ goŋ* ‘ringing of a big bell’; Savelyeva & Taksami 1970: 68) and as a marker of intensity (*tuzla* ‘cold’ vs. *duzla* ‘very cold’; Panfilov 1962: 7). In other positions they surface after sonorants, especially nasals, but remarkably this also includes cases where the nasal has been lost, e.g. *hug* ‘there’ (historically *hung*) or the indicative suffix *-j* (< **-nd*). Mattissen (2003: 73) mentions that voiced plosives are common in proper names and toponyms. All this points to a conclusion that for modern Nivkh voiced plosives should be seen as phonemic, even though there seems to be no minimal pairs apart from the intensification of qualitative verbs mentioned above. This mostly applies to Amur dialects; in SSD, plosives have been shown to have just a two-way (tense vs. lax) distinction (Hattori 1962).

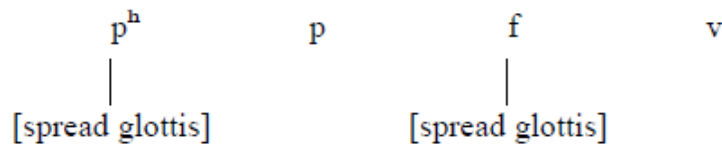


Figure 1: Asymmetric laryngeal contrast in Nivkh (Shiraishi 2006: 3)

Shiraishi (2006) describes laryngeal contrast in Nivkh obstruents referring to *Underspecification theory* (Avery 1996, 1997, Avery & Idsardi 2001), which treats phonological contrasts as asymmetric (Figure 1). The aspirated plosive, which is the specified member of the contrast, is assigned the unary feature [spread glottis]. The specified member is said to be, using Avery & Idsardi’s (2001) term, *dimensionally invariant*. Its acoustic and auditory cues, like aspiration, are stable, whereas the phonetic realisation of the unspecified member may vary contextually. This explains, at least partly, the voiced plosives: the voicing can be attributed to surrounding voiced segments or free variation. A similar contrast exists between voiceless and voiced fricatives: the latter are unspecified for [spread glottis].

In linguistic literature, there are basically three different practices of Nivkh transcription: Cyrillic-based (either the official script of Nivkh or some other version of Russian Cyrillic with Nivkh-specific graphemes added: Panfilov, Savelyeva & Taksami, SMNL), Latin-based (with diacritics used to indicate aspiration, uvulars etc.: Hattori, Gruzdeva, Mattissen) and IPA (Shiraishi). For this thesis, I have selected IPA as a universally used and phonology-friendly system.

2.5. Linguistic attrition in Nivkh

In addition to interference from the dominant language, a moribund language typically undergoes structural reduction known as *attrition*. Attrition is defined in Thomason (2001: 227–231) as loss of linguistic material which is not, in a moribund language, replaced with new material. Lexicon as well as the structural levels of syntax, morphology and phonology are affected. Many of the changes associated with attrition are not as such limited to dying languages; the key criterion is how fast and to what extent the simplifying and generalizing language-internal changes take place (Campbell & Muntzel 1989, Aikhenvald 2012). Changes in obsolescent languages are often individual speaker’s sporadic “mistakes” (from a fluent speaker’s point of view) instead of innovations spreading in the speech community (Aikhenvald 2012). Expected processes include overgeneralisation of unmarked (but, sometimes also marked) features, loss of distinctions not present in the dominant language (*negative borrowing*), loss of distinctions with low functional load, morphological and syntactic reduction, and optionality or free variation where traditionally specific rules should apply.

Gruzdeva (2002, 2015a) examines a number of attrition phenomena in Nivkh, including loss of specific lexical items, elimination of velar/uvular contrast, and reduction of the numeral classifier system. These are more or less observable in the conversations recorded for SMNL. Searching for the right word is commonplace, and the occasional confusion between velar and uvular consonant graphemes in SMNL texts is probably only partly due to inaccurate transcription. The functional load of velar/uvular distinction has always been low, but it is easy to imagine the lack of uvulars in Russian affecting speakers’ production and perception of these sounds.

As for the classifiers, volume 3 of SMNL contains a passage where speakers GL, GI and VX observe that different entities are counted with different

words (Shiraishi & Lok 2004: 60–65). GL (born 1946) tends to apply the classifier for dogs (which she apparently just learnt) for counting persons, for which she quickly gets corrected by VX (born 1943). Yet this distinction is just a fraction of the original 33 classifiers, of which majority have fallen into oblivion decades ago (Gruzdeva 2015a).

3. Consonant Mutation

3.1. Typological background

In typological comparison, Consonant Mutation in Nivkh can be treated as an example of a lenition process. Lenition and its opposite fortition are common but rather vaguely defined notions in phonology. Especially lenition is a cross-linguistically frequent sound change as well as a synchronic rule in certain environments: voiced plosives tend to spirantise, voiceless plosives become voiced and fricatives change to glides or elide completely. Lenition is often intuitively described as “weakening”; more specific phonological approaches include reduced articulatory effort and increase in sonority (Lavoie 2001). The sonority scale, ranked from the least to the most sonorous class of segments, is usually presented as a hierarchy like this:

stops < fricatives < nasals < liquids < glides < vowels

Voicing is considered sonorous, so that e.g. voiced stops are more sonorous and thus “weaker” than voiceless ones. This ranking looks clear at first sight but Cser (2003: 28–29) lists several controversies in it. However, these problems do not exist in Nivkh where only the left end of the scale is relevant (in CM, lenition [Spirantisation] sonorises stops to fricatives and fortition [Hardening] works in opposite direction). For example, he argues that the position of liquids on the scale is disputed because they are a phonologically determined class which is not uniform in its phonetic properties. Indeed, in Nivkh trills /r/ and /r̥/ are phonologically classified as fricatives, and lateral approximant /l/ does not alternate in CM.

In historical linguistics, lenition is often understood as a change towards the deletion of a segment. Synchronically, of course, the problem in this approach is that we cannot know whether a certain segment will eventually be deleted. Also, when examining documented chains of sound change we

notice that sounds may find their way to zero along different routes, which makes it impossible to determine if /t/ is universally closer to zero than /d/ or the other way round. We must also distinguish between weakening to zero and consonant loss without intermediate stages. (Cser 2003: 15–18)

Typical lenition environments are unstressed syllables and intervocalic positions (Cser 2003). Word-initial lenition is actually a typological *rarum*, i.e. a cross-linguistically infrequent phenomenon. This is because the initial position is perceptually important and therefore prone to fortition rather than lenition (Cser 2003: 20).

Word-initial consonant changes (without restricting to those that could be described as lenition) of various kinds are discussed in Iosad (2010). He gives *Initial Consonant Mutation* (ICM) the following definition:

Initial consonant mutation refers to a change in the featural make-up of the initial consonant in a word, the context for which cannot be stated exclusively in terms of independently pronounceable phonetic or phonological entities. (Iosad 2010: 106)

As examples of languages that exhibit ICM, he lists Welsh (and its Celtic relatives), Nivkh, dialects of Italian, Fula (Niger-Congo), Nias (Austronesian), Burmese, and also some examples from Australia and the Americas. Important notions in Iosad’s (2010) study (and also crucial in case of Nivkh) are *trigger* and *target*. Target is the word undergoing the initial alternation; trigger is the preceding lexical item which causes the following consonant to change. Following the definition above, at least the trigger but sometimes both the trigger and the target need to fulfil certain non-phonological criteria for the consonant mutation to occur. Consider the following example from Welsh:

- | | | |
|-----|--|--|
| (3) | a. <i>tŷ</i> house ‘house’ | c. <i>fy nhŷ</i> 1SG house ‘my house’ |
| | b. <i>dy dŷ</i> 2SG house ‘your house’ | d. <i>ei thŷ</i> 3SG.F house ‘her house’ |

(Iosad 2010: 106)

The initial consonant (phonetically [t^h]) of the citation form in (3a) lenites to [d̪] in (3b), nasalises to [ŋ^h] in (3c), and spirantises to [θ] in (3d). The terms used in Celtic studies are Soft Mutation, Nasal Mutation, and Aspirate Mutation, respectively. Note that in (3b) and (3c), the target undergoes different kinds of mutation despite the identical final segments in the pronouns; the possessive pronouns act as lexical triggers.

Terms lacking precise definition in Iosad's (2010) typology are *initial* and *word*. He admits operating "with an intuitive notion of 'word' as the actual instantiation of a lexical item, without committing to a particular stance". This is potentially problematic, at least in a somewhat polysynthetic language like Nivkh. Concepts of wordhood and incorporation in Nivkh are discussed thoroughly in Mattissen (2003: 64–121).

3.2. Consonant Mutation in Nivkh

The morpheme-initial lenition/fortition processes of Nivkh are called *Consonant Mutation* (CM) in Shiraishi's terminology.³ In CM, aspirated plosives alternate with voiceless fricatives and non-aspirated plosives alternate with voiced fricatives. A surface description of the required phonological context is that plosives spirantise after a morpheme-final vowel, glide or plosive, while fricatives harden into plosives after fricatives, nasals, and /l/. In addition to the phonological environment, the alternation requires a morpheme boundary within a noun phrase or a verb phrase (this entails that a verb after its subject does not alternate); frequent textbook examples are verbs following the primary object and nouns after an attribute, but also many grammatical suffixes alternate according to the final sound of the root. I will refer to these two opposite processes as Spirantisation and Hardening, after Shiraishi (2006). The NPs and VPs, inside which CM is applied, are called *syntactic complexes* (Nedjalkov & Otaina 2013: 9) or *syntactic sections* (Jakobson 1957: 78).

These basic principles of CM were described as early as in Krejnovich (1937) and have been cited in later literature with few changes; other descriptions include Jakobson (1957: 85–87), Gruzdeva (1998: 13–15), Mattissen (2003: 44–54) and Nedjalkov & Otaina (2013: 15–17).

³Another widely used label is *Consonant Alternation*.

Table 3 presents the obstruent inventory of the Nivkh language from CM point of view. Taking into account the remarks on trills and fricatives in section 2.4, the system is neatly symmetric: homorganic sounds that alternate with each other are found in the same column.

Table 3: Alternating obstruent sets of Nivkh (Mattissen 2003: 36)

| | | | | | | |
|-----|-----------------------------|----------------|----------------|----------------|----------------|----------------|
| I | <i>voiceless plosives</i> | p | t | c | k | q |
| II | <i>aspirated plosives</i> | p ^h | t ^h | c ^h | k ^h | q ^h |
| III | <i>voiced plosives</i> | b | d | ɟ | g | ŋ |
| IV | <i>voiceless fricatives</i> | f | ɸ | s | x | χ |
| V | <i>voiced fricatives</i> | v | r | z | ʝ | ʁ |

Among these obstruents, set I (voiceless plosives) alternates with set V (voiced fricatives) whereas set II (aspirated plosives) alternates with set IV (voiceless fricatives). The status of voiced plosives (set III) is special; they tend to alternate with sets I and V after sonorants, but not consistently (see section 3.4).

The plosives (I, II) spirantise to homorganic fricatives (V, IV respectively) in initial position of a noun which is preceded by a plosive- or vowel-final attribute. The following example with the noun *pəŋx* ‘soup’ illustrates the idea of Spirantisation. It is common practice in literature to join the words of the syntactic complex with a plus, showing the potential targets for CM (other than true bound morphemes which are separated by a hyphen as usual).

- (4) a. *cus + pəŋx*
 meat + soup
 ‘meat soup’
- b. *c^ho + vəŋx*
 fish + soup
 ‘fish soup’

(Gruzdeva 1998: 14)

Transitive verbs, which as a rule begin with fricatives,⁴ experience the opposite alternation, Hardening (V, IV → I, II) after the primary object when the final segment of the object is a fricative (or, sometimes, when it is a sonorant):

⁴There are a few lexical exceptions to this. They are verbs which preserve the initial plosive and CM behaviour of the noun they are derived from, see Mattissen (2003: 39).

- (5) a. *ni arak + ra-ʃ*
 1SG vodka + drink-IND
 ‘I drink vodka.’
- b. *ni c^haχ + ta-ʃ*
 1SG water + drink-IND
 ‘I drink water.’

(own field data)

These two opposite surface processes can be regarded as manifestations of a single phonological phenomenon (Shiraishi 2006); they produce similar outcomes (so that successive fricatives or successive plosives are avoided at morpheme boundaries) and their phonological trigger sets are complementary: Spirantisation applies where Hardening does not (after vowels and plosives), and vice versa.

In harmony with these rules, even grammatical suffixes have allomorphs depending on the final segment of the root. The following triplet presents the three forms of the dative suffix:

- (6) a. *cəx-toχ*
 top-DAT
 ‘to a (tree)top’
- b. *tu-roχ*
 lake-DAT
 ‘(in)to the lake’
- c. *mur-doχ*
 horse-DAT
 ‘to the horse’

(Gruzdeva 1997a: 81)

The voiced plosive in (6c) appears because the noun *mur* ‘horse’ has historically had a final nasal (cf. ESD *murŋ*).

Although these *attribute + head noun* and *object + verb* constructions as well as alternating grammatical suffixes are the most common examples of a CM context (and the only ones presented in earliest descriptions of Nivkh), the domain of CM is actually more general. Mattissen (2003: 33–34) writes about *dependent-head complexes*, syntactic units of synthesised dependent and head, of which there are four basic types. In addition to the two described above (N + V and N + N), the types are *verb stem + noun* (V + N, cf. (7) and *verb stem + verb* (V + V). The latter is, admittedly, not very relevant for CM, as the verbs involved are typically intransitive (8).

- (7) *cosq + vaχ kut-c*
 break + stone fall-IND
 ‘The broken stone fell.’ (Nedjalkov & Otaina 2013: 30)
- (8) *if nə-ur-ʃ*
 3SG work-be.good-IND
 ‘He works well.’ (Panfilov 1965: 31)

Remarkably, these units can be recursively combined so that CM is applied at each morpheme boundary within the complex. As a consequence, the syntactic complex may grow quite long. Example (9) shows an *object + verb* complex where the object itself is an *attribute + noun* complex *cus + t^ha + umgu*. The noun *umgu* ‘woman’ is modified by the attribute *cus + t^ha* ‘frying meat’ which itself is a N + V complex.

- (9) *ni cus + t^ha + umgu + ɲɾə-ʃ*
 1SG meat + fry + woman + see-IND
 ‘I saw the woman (who) had fried the meat.’

(Nedjalkov & Otaina 2013: 32)

CM is also attested after pronominal clitics as well as in reduplicated forms. The former process can be seen as a subtype of N + N complex (10). Reduplication, which may affect both nouns and verbal stems, is used to express iteration (11), intensification, or multiplication (Gruzdeva 1997b, Mattissen 2003: 19), sometimes even plural number (Gruzdeva 1998: 16–17).

- (10) *p^h-χal (< q^hal)*
 REFL-clan
 ‘one’s own clan’ (Shiraishi & Lok 2002: 11)

- (11) *c^hi ja:r ɲəŋ pal-roχ mər-ŋan to-ro-ʃŋa? (< to-)*
 2SG why 1PL.EXCL forest-DAT ascend-CVB cry-cry-IND-Q
 ‘Why do you cry many times when we climb the forest hill?’

(Nedjalkov & Otaina 2013: 369)

Nivkh has a fairly rigid constituent order, but because none of the basic syntactic roles are case-marked, CM can be the only means distinguishing between subject and object when one of them is omitted, resulting in the following minimal pair (12):⁵

- | | | | |
|---------|--|----|--|
| (12) a. | <i>eylŋ ro-d</i> child bring-IND ‘A child brought (sth.).’ | b. | <i>eylŋ + t^ho-d</i> child + bring-IND ‘(s.o.) brought a child.’ |
|---------|--|----|--|

(Gruzdeva 1997a: 83)

⁵This example is from ESD.

Example (12a) consists of two syntactic complexes, whereas in (12b), the entire utterance is a verb phrase that counts as a single syntactic complex, thus triggering the alternation at the *object + verb* junction within it.

One peculiarity in Nivkh CM is what Shiraishi (2006: 105) calls “the ‘Natural class’ problem”: Spirantisation applies after vowels, the glide /j/ and plosives, which do not form a natural class. This makes it practically impossible to describe CM autosegmentally as spreading of a certain phonological feature from the trigger to the target segment. One can also argue whether CM can be classified as word-initial; this depends on the definition of “word” which Iosad (2010) refuses to give. Since Krejnovich (1937), the status of syntactic complexes as words and dependent-head synthesis as incorporation has been debated; according to Nedjalkov & Otaina (2013: 6), syntactic complex is “a phonetic word”. Nivkh CM does not apply in the beginning of a complex but at morpheme boundaries within it; it is thus better described just as morpheme-initial.

Jakobson (1957: 94–97) suggests that originally, the initial obstruent of the word was always a plosive. Obstruents could be divided into strong and weak ones: aspirated plosives and voiceless fricatives counted as strong while non-aspirated plosives and voiced fricatives were weak. The contrast strong vs. weak was phonemic in the initial position, while distinction between plosives and fricatives was merely allophonic. In non-initial positions, the rule was inverted: plosives and fricatives contrasted but strong and weak obstruents did not (i.e. [x] and [ɣ] were contextual allophones). When the initial plosive got into the middle of a syntactic complex, it was realised as its fricative allophone if the phonetic context was favourable (that is, after a vowel or a plosive).

By means of internal reconstruction (e.g. Austerlitz 1972), we can also reduce the obstruent system of Nivkh to just two series, strong and weak, which are realised as stops or fricatives depending on the context. The fricative-initial transitive verbs of the modern language derive from forms with the transitivity marker *i-/e-* (e.g. **i + ta-* > **i-ra-* > *ra-* ‘to drink’) which has later mostly elided, but survives in some verbs as an object placeholder when there is no overt object (such as *i-ylu-* ‘be afraid of’). Fricative-initial nouns are explained by derivation from transitive verbs, onomatopoeia, or relatively recent sound change or loan etymology (Jakobson 1957: 93–94).

So, a glance at the history of the language reveals that Hardening is actually secondary to Spirantisation; it can be seen as exposing the underlying, non-Spirantised, base form. A synchronic approach to the topic is presented in Shiraishi (2000) and further developed in Shiraishi (2006). According to him, CM consists of perceptually motivated Spirantisation, which is non-local (meaning that it is not seen as having specific trigger segments) process that creates informational asymmetry in morpheme-initial positions. The other process of CM, Hardening, is local and “repairs” perceptually problematic sequences (such as successive fricatives) which remain in these contexts after the application of Spirantisation (Shiraishi 2006: 129–130).

Of other phrase-level phonology besides CM, let us take a brief look at a morpheme-final process called Velar/Uvular Spirantisation (e.g. Shiraishi 2006: 33–38). It is worth mentioning because it produces sequences that superficially look like counterexamples to rules of CM: morpheme-final plosives /k/, /q/ tend to spirantise when followed by fricatives /x/, /χ/ (13). This can be explained by assuming such an order of the processes that CM applies first and Velar/Uvular Spirantisation thereafter. In my data the CM-triggering underlying plosives are transcribed; (13a) is listed as *bambuk-xu*.

- | | | | | |
|------|----|---|----|--|
| (13) | a. | [bambux-xu] 'bamboo-PL' 'bamboos' (Shiraishi & Lok 2002: 36) | b. | [k ^h eχ + xu-ɾa-l]? fox + kill-USIT-Q 'You used to hunt fox?' (Shiraishi & Lok 2007: 69) |
|------|----|---|----|--|

3.3. Comparison with other languages

3.3.1. Initial consonant mutations in other languages

Nivkh is often compared to Celtic languages which constitute a more familiar example of ICM. The similarities are, however, superficial. Firstly, CM in Nivkh is much more straightforward, operating largely on lenition-fortition scale. Revisiting the Welsh example (3) in section 3.1, we see that Welsh makes use of three different processes, of which Aspirate Mutation in (3d) is possibly phonologically closest to what happens in Nivkh.

Another difference lies in phonological transparency of the mutations. As Iosad (2010: 107) puts it, Nivkh CM “is driven by the surface phonology,

but blocked in certain syntactic configurations”. The Nivkh CM system can be described as adding feature [+cont] in Spirantisation and [–cont] in Hardening. If we examine the most widely applied ICM in Welsh, Soft Mutation (Table 4), we cannot describe it as simply. The voiceless obstruents are systematically voiced in mutation contexts, but as for other segments, /g/ is mutated to zero, and /b/ and /m/ produce the same output /v/. So there is no one-to-one mapping between the sets, and also, voiced plosives occur both as mutated counterparts of voiceless plosives and bases of mutation for spirants (and zero). Even the aforementioned Aspirate Mutation differs from Nivkh CM by having a more restricted set of target segments and including an alternation of zero and /h/ (Thomas & Gathercole 2005: 2234).

Table 4: Soft Mutation in Welsh

| | | | | | | | | | |
|---------|---|---|---|----|----|---|---|---|---|
| radical | p | t | k | l̥ | r̥ | b | d | m | g |
| mutated | b | d | g | l | r | v | ð | v | ∅ |

The triggers for SM in Welsh are a set of certain prepositions, possessives and other grammatical words (see Thomas & Gathercole 2005: 2235), which do not have any obviously common phonological properties. The triggering conditions should therefore be synchronically seen as lexical rather than phonological. In other Celtic languages such as Scottish Gaelic or Irish, patterns and details are different but the phonological opacity of ICM holds.

In addition to Iosad (2010), even Mattissen (2003: 98–102) briefly lists various languages known for processes labelled as consonant mutation or alternation. Both Iosad (2010: 112) and Mattissen (2003: 101) bring up the example (14) from a West African language Mende (originally from Conteh et al. 1986: 109), which has certain resemblance with CM in Nivkh. The onset of the verbal root *kpàndì* ‘to heat’ becomes voiced after the object *ngúléí* ‘oil’ (14a). This is caused by a historical final nasal, in the same way as the initial non-aspirated plosive in Nivkh acquires voicing after an elided nasal in the attribute (see [6c] and the discussion in section 3.4). In (14b), the mutation is blocked by focusing the object, which changes the word order so that the object and the verb are no longer adjacent:

- (14) a. *ndòpòì ngúléí gbàndì-á* b. *ngúléí mià ndòpòì kpàndì-á*
 child oil heat-PFV oil FOC child heat-PFV
 ‘The child heated the oil’ ‘The child heated *the* oil’

In contrast to Nivkh, the mutation in Mende is unidirectional; there is no reverse (devoicing) process. Nivkh CM seems to be quite unique; all languages both in Mattissen's (2003) and in Iosad's (2010) survey possess some differences from Nivkh in their comparable phenomena.

3.3.2. Attrition in Celtic ICM

Before moving on to variation observed in CM, let us take a brief look at recent development in Celtic. The Celtic languages generally are more or less endangered, which raises the question how their ICM paradigms have survived among young speakers under pressure from English (or, in case of Breton, French). According to Thomas & Gathercole (2005: 2237–2240), there is a lot of variation in initial mutations of Welsh both between speakers and within a single speaker's idiolect, as well as between dialects. They also report that the domain of Soft Mutation is expanding at the expense of the other two mutations. Influx of English vocabulary also affects ICM as borrowed lexemes are less likely to undergo mutation than native ones.

But is SM also losing ground? One of the functions of SM is signalling feminine gender; Welsh has the same definite article for both masculine and feminine, but in feminine nouns SM is applied after the article. Thomas & Gathercole (2005: 2246–2254) insist that in areas where the proportion of Welsh speakers is highest, young adults have retained the ICM of feminine nouns as faithfully as older adults. Children did show weaker command of the system but it is possible that their grammar acquisition might not have been complete yet.

For comparison, Thomas & Gathercole (2005: 2240–2245) refer to earlier data (Jones 1998) from two communities where Welsh speakers were clearly in minority. In one community, speakers older than 75 years applied SM in 93 per cent of feminine nouns preceded by the definite article, while in the age group from 9 to 17 only 50 % did so. In another community, the mutation rate was more than 90 % for all speakers more than 40 years old, while the youngest group (9–17) only reached 44 %. It thus seems that the sociolinguistic setting matters: in an intensive contact with English, SM is receding.

Dorian (1981: 114–156) has studied grammatical change in East Sutherland Gaelic (ESG) with speakers in different stages of the language shift: *older fluent speakers* (OFS), *younger fluent speakers* (YFS), and *semi-speakers*

(SS). Various grammatical categories were examined, including some encoded by ICM. One of these was, again, gender. In ESG, the noun is supposed to undergo the process of Lenition after the definite article if it is feminine, and Nasalisation if it is masculine. OFS got this right with a 100 % accuracy and YFS achieved 94 %, but for SS the figure was 65 %. This development is akin to what Jones (1998) had observed for Welsh. Interesting results were measured for Lenition of attributive adjectives, which is expected to happen after feminine nouns. YFS applied this in 88 % of cases and even SS still reached 75 %. However, Lenition after masculine nouns (which is considered incorrect) was also observed, to some extent already with OFS (37.5 %) but especially with SS (78 %, i.e. more often than in feminine!). Among the semi-speaker generation, Lenition itself was not disappearing but the gender distinction associated with it was. In other words, the speakers had still learned the rule but not when to apply it.

One should obviously be careful when comparing two in many respects different endangered (families of) languages that happen to share one typological property, but it is nevertheless easy to hypothesise attrition of Nivkh CM: unlike for Celtic, there exists no stronghold of Nivkh where the language would be expected to resist contact-induced change better than elsewhere.

3.4. Attested variation in Nivkh Consonant Mutation

It has long been known that a major source of variation in Nivkh CM are word-final nasals, especially /n/ and /ŋ/. These sounds, still present in Sakhalin dialects, have mostly been lost in these positions in Amur dialect group. They have been referred to as “*weak*” *sonants* (Gruzdeva 1997a, 1998), *floating nasals* (Shiraishi 2000), *historical nasals* (Mattissen 2003), and *elided nasals* (Shiraishi 2006). Of these, from the perspective of WSD and AD analysed in this study, and since I operate on data collected by Shiraishi, I will use the term *elided nasal*.

The significance of elided nasals is that in CM triggers, they often affect the target word as if they still were present. In (15), after a vowel-final attribute we would expect the head noun to lenite, but the aspirated plosive is retained (15a) and the non-aspirated plosive is voiced (15b) due to the fact that *eya* ‘cow’ has had a final nasal (cf. ESD *ɛkaŋ*).

- (15) a. *eya + t^hom*
 cow + fat
 ‘butter’
- b. *eya + bəɲx*
 cow + soup
 ‘beef soup’

(Shiraishi 2000)

However, as demonstrated in Gruzdeva (1997a), this does not happen in all comparable cases, and different dialects have different tendencies of alternation. It is an attractive hypothesis that youngest generations of speakers tend to favour transparent CM patterns.

Mattissen (2003: 44–64) distinguishes between *strong* and *weak nasals*. The strong nasals behave in trigger position like plosives, causing Spirantisation. The weak ones turn voiceless non-aspirated plosives and voiced fricatives into voiced plosives (i.e. I, V → III in Table 3), which Mattissen refers to as *nasal alternation*. The division is historical and therefore synchronically unpredictable; for example, *təm* ‘cranberry’ has a strong nasal but *kelm* ‘raspberry’ has a weak one. Elided morpheme-final nasals, historically /n/ or /ŋ/ as mentioned above, count as weak and trigger nasal alternation, and so typically does overt /n/. The lateral /l/, on the other hand, behaves analogously to strong nasals.

Even in contexts not involving sonorants, H. Shiraishi (p.c.) states that the speakers do not apply CM in all expected contexts all the time. He also speculates that this may have been the case not only in the current sociolinguistic situation but also before; no old enough recordings are available for analysis to confirm this.

Accordingly, it is hard to investigate whether the variation of CM in Nivkh is due to attrition. However, the possibility together with the fact that some variation is known to exist is a good starting point for research. As was shown in section 3.3, similar processes have been documented in Celtic languages, and Dorian (1994) argues that there tends to be abundant idiolectal variation in small, marginalised speech communities. She reminds, however, that this *personal-pattern variation* can be difficult to single out from other sociolinguistic variables.

3.5. Fieldwork findings

During the field trip to Sakhalin in August 2014, I had an opportunity to meet Nivkh speakers in Nekrasovka, Nogliki, and Yuzhno-Sakhalinsk. As our research team encountered potential speakers, they were first interviewed for sociolinguistic background, and at this point I usually could decide if they were proficient enough in Nivkh for CM elicitation. Altogether there were six such speakers, all female. Their age range was from 35 to 73.

The phrases I elicited, by asking to translate into Nivkh the corresponding Russian expression, included the examples (4) and (5) and above, but also other phrases were tried if time permitted. For suffixes, instrumental allomorphy (e.g. *q^hax-kir* ‘with a spear’ vs. *mu-yir* ‘by boat’) was tested in addition to dative (6).

I noticed that many speakers did not apply, or hesitated to apply CM in *attribute + noun* constructions where the initial plosive of the noun is expected to lenite if the attribute ends with a vowel or a plosive. In elicitation, speakers translated ‘fish soup’ (4b) as *c^ho + pəŋx*, or uttered both *c^ho + vəŋx* and *c^ho + pəŋx* without a clear preference for either variant. The same was also observed with (5b), yielding *ŋi c^haχ + ra-ʃ* instead of the expected *ŋi c^haχ + ta-ʃ*. On the other hand, none of the speakers deviated from the expected dative suffixes and only the two youngest speakers showed minor uncertainty in instrumental allomorphy (suggesting *q^hax-yir* for ‘with a spear’). Because the data used was slightly different with each speaker and also because the speakers were fewer in number than I had hoped, I decided not to strive for accurate quantitative analysis of the results but settled for a simple three-step scale instead:

- *all*: the speaker uttered all the instances of certain type of CM as expected⁶
- *some*: the speaker followed rules of CM in some contexts but not in others; alternatively, she hesitated in selecting the preferred form or seemed to use the allomorphs in free variation.
- *none*: the speaker did not apply CM in (almost) any of the cases, at least not spontaneously. In practice, this usually meant that the speaker only used the citation form.

⁶The question of plosive voicing was ignored in this study.

Using these evaluations, a summary of the elicitation results is presented in Table 5. Based on the interviews, VT and ZL (who both also appear in SMNL) can be classified as fluent speakers, while the rest were more or less semi-speakers. NS was born in the Nogliki region (i.e. East Sakhalin dialect area), others came from various villages of northwestern Sakhalin. VT and ZL had acquired Nivkh as their first language and learned Russian for the first time in school; OM, and especially the younger speakers, had been exposed to both languages already at home. It is exceptional for anyone of TT’s age to have any significant knowledge of Nivkh, and it turned out that she worked as a teacher of the Amur dialect in a school in Nekrasovka. Nevertheless, her proficiency was the weakest of the group.

Table 5: CM “faithfulness” in elicited phrases (Anttonen et al. forthcoming). Speaker (year of birth); N = *attribute + noun* complex; V = *object + verb* complex; S = case suffixes.

| Speaker | N | V | S |
|-----------|------|------|------|
| VT (1941) | some | none | all |
| OM (1943) | some | some | all |
| ZL (1946) | all | all | all |
| AX (1957) | all | some | all |
| NS (1959) | some | some | some |
| TT (1979) | none | some | some |

The two youngest speakers clearly had a tendency to favour citation forms, but even the oldest, VT, did not produce many of the expected alternations spontaneously. It seems that for the current speakers, the process of CM is on its way from active competence to passive knowledge: when speakers who failed to apply CM were told the “correct” form, they always accepted it as well.

Shiraishi (2000) reports results from a similar study (albeit including *attribute + noun* complexes only) conducted in 1999. He had interviewed four speakers, also all female, with years of birth ranging from 1929 to 1942. Apart from post-sonorant contexts, only the youngest informant deviated from the traditional CM pattern; interestingly, she favoured fricatives over plosives in post-fricative contexts (*lanŋr + rom* ‘seal fat’, *c^hxəf + vəŋx* ‘bear soup’). In the light of later research, however, this does not seem to be a general tendency among her (or the younger) generation.

Largely because of these fieldwork results, I was inclined to an initial hypothesis that the variation observed in CM is at least partly caused by language attrition. The younger speakers seem more prone to using non-standard allomorphs, yet there is no common tendency among them which could be explained as a uniform language-internal process. It also seems that suffixes preserve their expected CM pattern even when *attribute + noun* and *object + verb* complexes do not.

4. Method and data

4.1. The series *Sound Materials of the Nivkh Language*

My data comes from the sound archive *Sound Materials of the Nivkh Language, SMNL* (Shiraishi & Lok 2002, 2003, 2004, 2007, 2008, 2009, 2010, 2011, 2012, 2013, Shiraishi & Liutova 2014). This archive consists of 11 volumes with texts and rough transcriptions which are freely available online. The texts include free conversations as well as some folktales and even songs, but not elicited phrases. All the texts are in Amur dialects, mostly in West Sakhalin variety (for dialectal grouping, see section 2.3). This means that the potential dialectal variation of CM is not examined, but the Amur dialects as the most innovative ones should provide insight into the phenomenon.

As my intention was primarily to examine natural conversation in Nivkh, I decided to leave out volumes 2 (Shiraishi & Lok 2003) and 8 (Shiraishi & Lok 2011). These contain folktales and songs and thus consist mainly of material devised in advance for reading or singing aloud.⁷ Also the latest volume 11 (Shiraishi & Liutova 2014), which was not yet published online at the time of my initial study, was left outside the scope. It also has a different co-author than the preceding volumes.

This leaves us with a data set of eight volumes, consisting of 5 hours, 26 minutes and 54 seconds of recordings, corresponding to 440 pages of transcribed material (not including free translations into English and Japanese or the introductory sections). The volumes, with the title usually naming the main contributor, are the following:

⁷Admittedly volume 1 (Shiraishi & Lok 2002), which I did include, is a borderline case in this sense.

- SMNL 1 (2002): *Folktales of V. F. Akiliak-Ivanova*. VI, daughter of a shaman, recounts five Nivkh legends. Total duration 36 minutes 30 seconds.
- SMNL 3 (2004): *Pygsk*. VX and other speakers reminisce about how the Nivkh used to live back in the days, and what kind of friends and relatives they had. They also show awareness of the features of the language itself, recalling the numeral classifiers of Nivkh. Duration 45:55.
- SMNL 4 (2007): *Leonid Ivanovich Iugain*. This volume begins with two pieces of conversation similar to the previous volume, explaining the traditional Nivkh way of life. In the other two parts, LI is interviewed on the topics of hunting and fishing. Duration 45:30.
- SMNL 5 (2008): *Galina Fiodorovna Ialina*. Two rather long conversations again on traditional topics, such as Nivkh cuisine and shamans. Duration 43:05.
- SMNL 6 (2009): *Konstantin Iakovlevich Agniun*. KA tells about bear hunting and other adventures of his youth. Duration 52:19.
- SMNL 7 (2010): *Valentina Filimonovna Tiavkan*. VT shares her knowledge of Nivkh culture in 19 short pieces of conversation. Topics include preserving food for the winter and struggling to remember Nivkh words. Duration 36:10.
- SMNL 9 (2012): *Iartiuk*. ON and other speakers discuss traditional fishing, Nivkh clans and inhabitants of the village. In the introductory text of this volume it is pointed out that ON was possibly the last person to possess such a profound knowledge on these topics. Duration 28:12.
- SMNL 10 (2013): *Zoia Ivanovna Liutova*. In this volume, ZL and other younger speakers ask ON questions about Nivkh culture: shamans, handicraft and other topics. ZL herself remains rather passive in the conversation. Duration 39:13.

One of the challenges of the present study is that the transcription in SMNL is not, and is not intended to be, phonetically accurate (H. Shiraishi

p.c.), and the practices vary slightly from one volume to another. For instance, the dative ending is transcribed *-toχ* in some parts of SMNL and *tox* in others, and the distribution of the infinitive endings *-c* and *-j* is not straightforward. The grapheme <κ> /k/ is sometimes written where <ϣ> /q/ should be, even in initial positions where the two are clearly contrastive. The Cyrillic orthography itself also leads to some ambiguities; for example, the sequence <ти> has two potential readings /ti/ and /ci/. In most situations, I have not even tried to verify the transcription outside CM contexts.⁸

All the speakers in SMNL are more or less fluent in Nivkh but the current sociolinguistic situation is reflected in the conversations; heavy code-switching and short conversations entirely in Russian are encountered in many volumes. At times, the speakers urge themselves to switch back to Nivkh, being aware that they are being recorded by a linguist.⁹ They may also correct each other's language, like in the following piece of conversation (16). The Russian linguistic material used in Nivkh conversation is highlighted in the example by underlining. This practice is followed in all subsequent examples from SMNL.¹⁰

(16) KA: ...ro-r vi-t c^{hi}η-doχ hukr-toχ Japon-gu-toχ.
 take-CVB go-CVB 2PL-DAT there-DAT Japan-PL-DAT
 ‘... they took it with them to you, to Japan.’

NV: *sizm-yu*.
 Japanese-PL

‘The Japanese.’

KA: *imyū eto*,
 3PL DEM

‘Yes, them.’

NV: *sizm-yu*. *c^{hi} loci + jit-ŕ* “Japon-gu-toχ”.
 Japanese-PL 2SG Russian + speak-CVB

‘Sizmyu (is the Nivkh word). You say in Russian “Japongutoχ”.’

⁸A table of correspondences between SMNL transcription and IPA is presented as an appendix.

⁹This entails that their “free conversation” is actually more or less affected by the research setting. For this *observer's paradox*, see Labov (1972).

¹⁰In addition, it needs to be mentioned that glosses for examples retrieved for SMNL are mine, and naturally I am responsible for any errors. Examples from other sources retain the gloss given by the author of the source.

KA: *hə, nu ji hongut təu-ŋan j-aya-nʃ?*
 yes well 1SG so get.used.to-CVB 3SG-disturb-IND

‘Well, that’s how I’m used to say, how can I help it?’

(Shiraishi & Lok 2009: 9)

According to Aikhenvald (2012), a language falling out of use tends to absorb material from the dominant language so extensively that unusual outcomes, such as mixed paradigms or borrowed bound morphemes, may ensue. This is visible in SMNL: one can frequently notice mixed word-forms such as *ŋ-brat* ‘my brother’ where the Nivkh prefix of first person singular *ŋ(i)-*, indicating possession, is used with the Russian noun *brat* ‘brother’.

One can also find interesting examples of Russian lexicon imported into Nivkh morphosyntax (17), where Nivkh dative ending *-dox* is applied to *kolxoz* ‘kolkhoz’ and the verb *perexoditʲ* ‘to proceed, to pass on to’ is inflected with a temporal converb of Nivkh, *-ŋan*.

- (17) *hə-ju kolxoz-dox perexodi-ŋan*
 that-PL kolkhoz-DAT proceed-CVB
 ‘they moved to the kolkhoz’ (Shiraishi & Lok 2004: 31)

Example (18) demonstrates abrupt switching between languages: the sentence is started in Russian but is negated in the end with the auxiliary verb structure from Nivkh.¹¹

- (18) *perednʲ-uju skorostʲ vəkʲlʲutʃa-jet-ta qʰau-ŋ*
 front-F.SG.ACC gear.ACC switch.on-3SG-SUP not.be-CVB
 ‘he did not shift the gear into neutral’ (Shiraishi & Lok 2009: 33)

4.2. Database

4.2.1. Structure and principles of the database

The purpose of the study is to examine whether the application of CM is inconsistent as the recent results from elicitation sessions indicate. It is well possible that unnaturalness of elicitation as a speech situation disrupts CM and leads to overuse of citation forms. To investigate prevalence of CM,

¹¹According to literature, the supine ending on the negated main verb should be *-toχ/-doχ*. In SMNL, it is often attested in a reduced form.

I have gathered a database of phrases or collocations where CM “should” occur.

Of all syntactic complexes in SMNL, I only have collected those that have a potentially alternating initial obstruent in the target word. In the following, (19b) is no less of a syntactic complex than (19a), but since /ŋ/ never alternates, it is not included. On the other hand, /f/ would be included even in a post-plosive context due to its potential to alternate, even though it is not expected in that particular case.

- | | | | | | |
|------|----|-------------------------------|------------------|----|---------------------------------|
| (19) | a. | <i>als + p^he-c</i> | (< <i>fe-c</i>) | b. | <i>als + ŋa-r</i> |
| | | berry + pick-IND | | | berry + go.for-CVB |
| | | ‘pick berries’ | | | ‘when (she) went berry-picking’ |

(Shiraishi & Lok 2010: 38)

The basic rules of CM were already described in section 3.2, but the contexts involving a final sonorant in the trigger were mentioned to exhibit variation. Before analysing the SMNL data, some set of rules should be presented for these cases as well for meaningful comparison.

The scheme of CM in Table 6 corresponds to what Gruzdeva (1997a: 92) presents for the Amur dialect of Nivkh: the expected sound is a voiced plosive in case of voiceless plosives in target nouns (and suffixes) and voiced fricatives in target verbs. In other cases there is no mutation, meaning that the sound of the citation form is retained for aspirated plosives of nouns and voiceless fricatives of verbs. In terms of Figure 1, sounds unspecified for [spread glottis] change to voiced plosives and the ones specified for it are not affected. In section 3.4, I presented Mattissen’s (2003) classification of nasals into strong and weak ones; however, Mattissen (2003: 45) herself admits that in modern Nivkh, nasal-triggered mutations are being regularised and “the original distinction is thus falling into decay”. Gruzdeva (1997a: 92), as well, refers to her findings as “general tendencies”. Thus, the choice of “expected behaviour” in post-sonorant contexts is largely arbitrary; it remains to be seen which model corresponds best to SMNL data.

Table 6: Expected sounds in CM contexts. C = initial sound of the citation form, E = expected sound in CM contexts, ES = expected sound in post-sonorant (including elided nasal) CM contexts

| nouns and suffixes | | | verbs | | |
|--------------------|---|----------------|-------|----------------|----|
| C | E | ES | C | E | ES |
| p ^h | f | p ^h | f | p ^h | f |
| t ^h | ɾ | t ^h | ɾ | t ^h | ɾ |
| c ^h | s | c ^h | s | c ^h | s |
| k ^h | x | k ^h | x | k ^h | x |
| q ^h | χ | q ^h | χ | q ^h | χ |
| p | v | b | v | p | b |
| t | r | d | r | t | d |
| c | z | j | z | c | j |
| k | ʏ | g | ʏ | k | g |
| q | ɸ | G | ɸ | q | G |

For checking meanings and citation forms of individual words my primary reference was a Nivkh-Russian dictionary (Savelyeva & Taksami 1970) which contains 13 000 words in Amur dialect. I also used a smaller dictionary of Sakhalin dialect (Sangi & Gashilova 2003, about 2 000 words).

Each entry in the database has the following information, stored in corresponding columns of the database table. This enables looking for correlations between different parameters by querying the database.

- Volume (i.e. number of book) in the SMNL series.
- Chapter of the book. Each volume of SMNL is divided into chapters, which typically represent the distinct stories or conversations collected in it.
- Row number. Within chapter, the rows of text are numbered. Together with the volume and chapter, this makes it easy to identify and locate each phrase afterwards.
- Collocation of trigger and target. This contains the words between

which CM takes place, or in the case of suffixes, the word form with the suffix separated by a hyphen.

- Gloss or translation of the collocation. As the collocations are short and not always complete phrases the glosses are often rough. Their function is merely to store some semantic information about the context.
- Base (“non-mutated”) sound.¹² For nouns and verbs this means the initial consonant of the dictionary form. For suffixes, not having a free form, the choice is somewhat arbitrary but I have regarded the voiceless plosive as the unmarked variant.
- Expected sound, according to Table 6 above.
- Sound that is realised in the utterance. As the transcriptions in SMNL are not always error-free or accurate, and because the sheer amount of data makes acoustic measurements an infeasible option, this column contains my own impression of the sound. When it differs from what has been transcribed, I usually have mentioned that in the column for notes (see below). When in doubt, I have relied on the transcription.
- Type of morphosyntactic environment: *attribute + noun*, *object + verb*, suffix or postposition. In other words, the potential target element is either a noun (abbreviated as N), verb (V), or suffix/postposition (S).
- Is the potential trigger word of CM a recent loanword or a totally unadapted Russian word? Shiraishi (2006: 97) states that even foreign words “may participate in CM as triggers”. The multitude of Russian loans, proper names and code-mixing in the data makes it worth examining how systematically this really happens.
- Is the potential target of CM a recent loanword? Recent (Russian) loanwords usually resist being targets of CM (Shiraishi 2006: 97). Older, well-assimilated (such as Tungusic) loans behave like native words.

¹²The database used supports UTF-8 character encoding and thus also IPA. However, initially I used other tools which had problems with diacritics, which is why p^h, t^h, c^h, k^h, q^h, and ɣ are written in the database entries as p', t', c', k', q', and r', respectively.

- Is there or has there been a final sonorant in the trigger item? For determining the presence of an elided nasal, I have mostly relied on the dictionary (Savelyeva & Taksami 1970) which also gives the words in ESD.
- Speaker of the utterance, abbreviated with initials. The sociolinguistic biography of most speakers in SMNL is fairly well documented.
- Miscellaneous notes. This column has been mostly for my temporary reminders or unclear cases requiring future research, but it was also used for mentioning known exceptions to CM or other remarks about the lexemes involved.

57. хоґот эґт п'рыт, чхыф т'ор п'рыт, | Затем они пришли домой, и
 затем домой пришли медведя принесли пришли | | принесли убитого медведя,

Figure 2: A passage from SMNL vol. 1.

As a concrete example of what is collected, let us examine a snippet (Figure 2) from the first volume of SMNL (Shiraishi & Lok 2002). The speaker of the utterance is the main informant of SMNL 1, VI. Typically for narratives, the passage contains converb chains and repetition. The text is not segmented into morphemes and the Russian gloss is just word-per-word, neither are syntactic complexes indicated in any way. Converted to IPA and glossed more accurately, the snippet is written as (20):

(20) *hoʔot ey-t pʰrə-t, cʰxəf+tʰo-r pʰrə-t*
 then return-CVB come-CVB bear + bring-CVB come-CVB
 ‘then they came home, bringing the bear’

The relevant part here is *cʰxəf+tʰo-r*, which is a syntactic complex of a transitive verb and its object. The dictionary form (indicative) of the verb is *ʔoʔ*. Both words are native, or at least not recent loans. Neither the dictionary nor other sources indicate that the object *cʰxəf* would have had a final nasal. After checking from the recording that the initial sound of the verb really is /tʰ/, one can conclude that CM is applied as expected. For this entry, the parameters listed above get values shown in Table 7.¹³

¹³For the exact format how the information is stored, an excerpt of the database is attached as an appendix. The full database is uploaded at <http://numberkuus.org/~jluukkoni/nivkh/>.

Table 7: An example of a database entry.

| | |
|---------------------------|------------------------------|
| Volume | 1 |
| Chapter | 1 |
| Row | 57 |
| Collocation | $c^h x \partial f + t^h o r$ |
| Gloss | bringing the bear |
| Base sound | r |
| Expected sound | t^h |
| Realised sound | t^h |
| Environment | V |
| Trigger loanword | no |
| Target loanword | no |
| Final sonorant in trigger | no |
| Speaker | VI |
| Notes | – |

One weakness in my methodology is that it does not systematically record application of CM in unexpected contexts. It is probably not very common, but apparently it can happen, and in the course of data exploration some obvious instances were discovered. In (21), there is no object present for the verb $k^h l u$ - ‘be afraid’, but VT uses it as if there was a fricative-final object, in this context probably the word $c^h x \partial f$ ‘bear’. The expected stem without overt object would be $i-y l u$.¹⁴

- (21) $i f \quad k^h l u - j l a, \quad c^h - o y l a ? \quad k^h l u - t o \quad q^h a u - j l a ?$
 3SG be.afraid-IND-Q 2SG-child be.afraid-SUP not.be-IND-Q
 ‘He is afraid (of the bears), your son? Isn’t he?’

(Shiraishi & Lok 2010: 60)

4.2.2. Collecting syntactic complexes

I have tried to list in the database all obvious instances of *attribute + noun* and *object + verb* complexes. One should keep in mind the argument marking pattern introduced in section 2.1: some (di)transitive verbs are “surprising” from the perspective of direct object languages like English or Russian. Examples of these are $s i$ - ‘put something **somewhere**’, $f i$ - ‘be **somewhere**’

¹⁴H. Shiraishi (p.c.) proposes that $k^h l u - j$ could actually be a dialectal citation form.

or *fur-* ‘talk/say (something) about **something**’, with the boldface-marked arguments assuming the primary object position in Nivkh.

105. НВ: **ыйф, ыйф** *это* **хы чоғу т’хопиныр** | Всегда ловит рыбу
всегда эту рыбу ловит |

Figure 3: A passage from SMNL vol. 6, containing three CM contexts.

An example of an *object + verb* complex collected in the database was illustrated above in Table 7. In addition, we must take into account chained complexes which were discussed in section 3.2 (example 9). The 105th row of the sixth chapter in SMNL 6 (Figure 3) includes the complex *hə + c^ho-yu + t^hxop-inə-r* ‘going to catch those fish’. For the database, this is split in two parts: the *attribute + noun* complex *hə + c^hoyu* and the *object + verb* complex *c^hoyu + t^hxopinər*. Altogether, the passage contains three CM junctions and thus yields three database entries as it also contains the plural suffix in *c^ho-yu*.

4.2.3. Collecting suffixes and postpositions

Of the numerous suffixes that alternate in Nivkh, I have chosen to include only adnominal ones. There are two main reasons for this. First, verbal morphology in Nivkh is fairly complex and many postverbal suffixes are known to resist CM,¹⁵ such as causative *-ku/-gu-* (Shiraishi 2006: 92–93). The other justification is practical; it is wiser to study large enough amount of data for a carefully selected subset of suffixes, rather than searching for all suffixes in a smaller sample, which would be the other option in the scope of a Master’s thesis.

The following alternating adnominal suffixes are listed in Nedjalkov & Otaina (2013: 49–59). The list includes case suffixes as well as the number markers (plural and comitatives):

- Plural: *-ku/-yu/-gu/-xu*. Historically, and in ESD, *-kun/-yun/-gun/-xun*. The fourth variant *-xu(n)* is attested after voiceless plosives. Also the other *k*-initial suffixes have an analogous fourth allomorph.

¹⁵This is because they actually attach to the historically *η*-final participial, which blocks Spirantisation.

- Dative (dative-additive): *-roχ/-toχ/-doχ*. This suffix is also referred to as *allative* (Mattissen 2003, Shiraishi 2006). In addition to these three allomorphs, it also has contracted variants *-rχ/-tχ*. I have decided to exclude these from the database, as they chiefly appear in short, often fossilised forms like personal pronouns (e.g. *ne-rχ* ‘to me’.)
- Instrumental: *-kir/-yir/-gir/-xir*. In some dialects, the final segment may also be *r*, *t*, or *s*.
- Destinative (also *limitative* (Gruzdeva 1998) or *terminative* (Mattissen 2003)) *-tʰəkə/-rəkə*, *-tʰχa/-rχa/-rga*, *-toβo/-roβo/-doβo*. This denotes a limit in space or in time (‘as far as, as long as’).
- Dual comitative: *-ke/-ye/-ge/-xe*. This is used when each of the conjoined nouns refers to a single entity. In ESD and NSD *-kin/-yin/-gin/-xin* (Gruzdeva 1998: 17).
- Plural comitative: *-ko/-yo/-go/-xo*, *-kon/-yon/-gon/-xon*, *-kunu/-yunu/-gunu/-xunu*. These three series have slightly different usages, but they all are used when each of the conjoined nouns refers to two or more entities.
- Conjoining suffix: *-toyo/-royo/-doyo*. Used for conjoining more than two coordinated nouns in the primary object position.
- Conjoining negative: *ri/-ti/-di*. An intensifying particle (‘even’), adnominally used for coordinated nouns dependent on a negative verb form. Nasal-final in ESD (Mattissen 2003: 11).

In addition to suffixes proper, I also have included postpositions. Nivkh postpositions, or *relational morphemes* in Mattissen’s (2003) terminology, are clitics which in transcriptions are often written attached to their host noun. They behave just like case suffixes with respect to CM, and since border between the two classes is somewhat vague and they are not frequent enough to result in excess data, there is no reason to exclude them. Nedjalkov & Otaina (2013: 59–62) list the following:

- *-t^hxə/-rxə* ‘on’ (probably the most common of these)
- *-q^homi/-χomi* ‘at the side’
- *-t^haγr/-ṛaγr* ‘between, among’
- *-t^hara/-ṛara* ‘against, opposite’
- *-k^hrərə/-xrərə* ‘for the sake of, for, because of’
- *-tulku/-rulku* ‘along, through, over, across’
- *-t^hməsk/-ṛməsk* ‘across, over sth’
- *-tomsk/-romsk* ‘together, with, to(wards)’

It must be pointed out that neither of these lists, especially the latter, are exhaustive. There are also some cases where it is not easy to draw the line between a converb and a grammaticalised postposition, and postpositions with a nominal origin still possess some properties of a noun, such as ability to attract case suffixes (for some etymologies of cases and postpositions, see Mattissen 2003: 9–10, 82–83). For the sake of simplicity, I have restricted my study to suffixes and postpositions listed above.

Before moving on to the results of the study, I have to state a few potential CM contexts which I have decided to ignore in this study. They include:

- lexicalised expressions such as *huk(r)-toχ* ‘there, that way’, *ṛivγ + jit-ṛ* ‘in Nivkh’ (from the verb *zit-c* ‘to speak’), or *məxc-kir* ‘really’. These may or may not obey regular CM but either way, from the synchronic point of view they are fixed expressions, which are not expected to vary in their form. This also applies to the plural-marked pronouns *im-γu* ‘they’ and *həʃ-γu* ‘these, they’.
- utterances which in the conversation have a noticeable pause at the critical morpheme boundary. CM is pause-sensitive and is blocked when a conversational pause is inserted (Shiraishi 2006: 96).
- reduplicated stems such as *qal-bala-* ‘(be) white’, *cojx-cojx-ux* ‘in the corners’ etc. These, too, are often lexicalised and occasionally unpredictable in their alternations, to the extent that it is hard to define the base form or “expected behaviour” in their case.

- those involving proclitic personal pronouns like the reflexive p^h -. These are very frequent and do not seem to provide any surprises. The lenition of plosives after p^h - is also more due to syllable phonotactics than application of CM (Shiraishi 2006: 97).
- suffixes on verbs, even those that normally occur with nouns. For example, the plural marker *-ku/-yu/-gu/-xu* is often attached to verbs as well, but I have listed it only when used adnominally.
- utterances produced by non-native speakers; in SMNL, this means the scholars who conduct the study, occasionally participating in the conversation. This should be obvious.
- totally unclear utterances where I could not, despite the transcription, determine at all what was said in the recording. In these cases transcription probably conforms to the norms of CM and does not prove anything.

4.3. Analysis

The results stored in the database were analysed in two ways. The database approach makes it possible to quickly retrieve quantitative answers to various questions. For example, which initial obstruent undergoes CM the most predictably? Or, how many CM contexts involving a loanword are there, and how many of them exhibit regular CM? It would even be possible to print the long list of all occurrences where the target sound differs from the expected sound. In the course of the study, I found it useful to write down problematic issues into the *notes* column; later, I could run a query to list all non-empty *notes* fields to get a list of utterances needing further attention. And so on; the possibilities are diverse.

While technical details of database management are probably neither relevant for the linguistic analysis, nor of great interest to a linguistically oriented reader, it is nevertheless appropriate to explain briefly what kind of tools I used. I created and operated the database with Microsoft Access, which is an application for managing small-scale relational databases. It belongs to the widely used Microsoft Office application suite.

Access has a graphical user interface, but it also supports Structured Query Language (SQL), which is the standard programming language for

database management. I created my Nivkh database by typing the entries (exemplified in Table 7) into the Access user interface, but for retrieving the data I mainly used SQL queries. For example, if I really wanted to list all the occurrences of “unexpected” CM, I could run the following query:

```
(22) SELECT * FROM smnl WHERE expected <> realized
```

This would list all the records in my database table (named *smnl*) where the expected and realised sound do not match. It is also possible, and often very useful, to list the results in a certain order or grouped by a certain parameter, or just to get the number of records matching some condition. The following query lists how many entries per speaker there are in the database, starting from the highest number:

```
(23) SELECT speaker, count(*) FROM smnl  
      GROUP BY speaker  
      ORDER BY count(*) DESC
```

Also, because SQL queries can be saved, I could run them repeatedly as I gathered more data without having to write them again. I have saved most of the queries I used in my database file, so that an interested reader may take a look also at more complicated queries than the ones presented above.

This way, I have compared CM realisation between different types of constructions (*attribute + noun*, *object + verb*, *suffix*), between speakers and even between various initial consonants. These statistics are presented and analysed in sections 5.4, 5.5, and 5.6, respectively. But the SQL queries were also a great help for picking the best material for the other, more qualitative approach: examination of the unusual CM instances. What cannot be achieved by printing out statistics and looking at numbers are the reasons behind the CM variation; this part of analysis is inevitably more or less speculative: as explained in section 2.5, attrition is not easy to prove to be the driving force behind an individual change in a language. Also, while the sample of more than 2 300 CM contexts is sounds extensive, it is still not a proper speech corpus, being too small to really give, for example, indisputable evidence for the changed CM behaviour of a certain lexeme. With these cautions in mind, section 5.3 presents a number of phrases found in the data that are unusual from the CM point of view, with possible explanations. Sections 5.1 and 5.2 deal with the recognised phenomena of CM

variation after sonorants and loanwords. Examples of these are examined in the light of predictions proposed in earlier research.

5. Results

5.1. Post-sonorant variation

Surfacing or elided final sonorants in CM contexts are frequent: of 2 357 CM contexts listed in the database, 960 involve a final sonorant in the trigger. In 494 of these, the resulting target sound corresponds to the expected scheme outlined in Table 6. For example, in (24a) the initial /q^h/ in *q^hal* ‘clan’ remains unchanged after the overt nasal /n/ in the name *Pilavon*. This is the default behaviour for aspirated plosives. In (24b), the dative ending *-dox* follows the plural suffix *-xu*. The initial /d/ in the dative is due to the elided nasal in the plural suffix.

- (24) a. *p^h-χal-ax* *Pilavon + q^hal mu-gu-ta*
 REFL-clan-ACC Pilavon + clan become-CAUS-FOC
 ‘Their clan become the Pilavon¹⁶ clan.’ (Shiraishi & Lok 2002: 11)

- b. *n-ətək* *n-ətik-xu-dox* *n-ro-r* *vi-r*
 1SG-father 1SG-grandmother-PL-DAT 1SG-carry-CVB go-CVB
 ‘my father brought me to my grandparents’

(Shiraishi & Lok 2008: 46)

On the other hand, there are almost as many, 466, database entries where the trigger sound is something else than Table 6 suggests. Actually, these constitute the majority of all unexpected CM realisations (560 in total).

Let us examine different types of these situations. After a final sonorant in the object, the trigger verb may or may not undergo Hardening; according to the model of Table 6, those beginning with a voiceless fricative typically do not. SMNL 9 includes a couple of conversations about kinship (Shiraishi & Lok 2012: 42–47), in which the verb *χau-* ‘to call’ tends not to alternate. The following utterance (25), however, is interesting. The speaker first uses the plosive-initial variant but then starts over the sentence, apparently correcting herself.

¹⁶Literally ‘(of) the big village’.

- (25) *Fugun + q^hau, eto Valik + ətək + ətək Fugun + χau-c*
 Fugun + call that Valik + father + father Fugun + call-IND
 ‘He was called Fugun, that’s what Valik’s father’s father was called.’

(Shiraishi & Lok 2012: 43)

It seems that in most cases throughout SMNL, Nivkh names with a final /n/ like *Fugun, Smedun, Jugain* etc. attract suffixes with an initial fricative (instead of the voiced plosive), for example:

- (26) *Janlan-yunu Smedun-yunu sək ətək + jə-n*
 Ianlan-COM.PL Smedun-COM.PL all father + one-CL
əmək + jə-n ha-yar
 mother + one-CL be.SO-ADVERS
 ‘Ianlan and Smedun, they all have the same father and mother.’

(Shiraishi & Lok 2012: 47)

Despite some counterexamples,¹⁷ the tendency is at odds with Mattissen’s (2003: 45–46) scheme of strong and weak nasals, in which dental final nasals are always weak and should thus trigger plosive-voicing CM. A related example of /ɣ/ instead of expected /g/, but with a different nasal and an *object + verb* complex can be seen in the following (27):

- (27) *p^hi eŋ + ye-r*
 REFL skis + take-CVB
 ‘taking his skis’ (Shiraishi & Lok 2002: 15)

The plural suffix has an elided nasal, but in a discussion about building a house (Shiraishi & Lok 2012: 26–28), ON repeatedly uses the form *ciyŋ-ku-kir* instead of *ciyŋ-ku-gir*:

- (28) *hə + ŋays-ku ciyŋ-ku-kir pak ləŋ-ta*
 that + wall-PL wood-PL-INS only make-COORD
 ‘The walls are made only from wood.’

The demonstrative *hə* ‘that’ forms an *attribute + noun* complex with its head noun. In ESD it is attested as *həŋ*, so it has an elided nasal, and Mattissen (2003: 53–54) insists that “all determiner prefixes trigger nasal alternation”. This means that the following phrases (29a) and (29b) should

¹⁷E.g. *Smedun-gu* (Shiraishi & Lok 2004: 19), *Lezŋaran-gu* (Shiraishi & Lok 2008: 17).

be *hə + gins* and *hə + bal* respectively, but no voicing is either transcribed or observable on the recording:

- (29) a. *hə + kins*
 that + devil
 ‘that devil’
- b. *hə + pal*
 that + mountain
 ‘that mountain’

(Shiraishi & Lok 2002: 38)

This seems to apply to virtually all occurrences of *hə*¹⁸ as well as other deictic determiners (*ku* ‘that (not visible)’, *tə* ‘this’, *hoqo* ‘that kind of’), which could mean that the nasal loss has happened also on the underlying level. However, as the process has not resulted in “transparent” CM (i.e. *hə + yins*, *hə + val*) either, it seems that CM has disappeared from this structure entirely.

It must be admitted that the phonemic status of voicing in plosives is marginal and that voicing in Nivkh voiced plosives is often rather weak. This is especially true for the main speaker of SMNL 1, VI. The speakers’ varying tendency to apply voicing is discussed later in section 5.5.

Sometimes even fricatives and plosives can be hard to tell apart, and this is especially case with velars and uvulars. Example (30) includes two consecutive phrases from a story in SMNL 1. The word *k^hiri* has strong initial friction in both of them. In (30a), the closure of a plosive can still be heard but in (30b) /x/ sounds to be the preferred choice of transcription. Another detail worth noticing is the initial /t^h/ in the verb of (30a); this could possibly be a sign of an original final nasal in *k^hiri*.

- (30) a. *qan + k^hiri + t^hnə-ʃ*
 dog + urine + see-IND
 ‘(he) saw the urine of a dog’
- b. *hə + qan + xiri*
 that + dog + urine
 ‘the urine of a dog’

(Shiraishi & Lok 2002: 21)

I managed to find an instance of even clearer variation within a lexeme. The noun *umgu* ‘woman’ has an unrelated equivalent in other dialects (Mattissen 2003: 6), but it has been reconstructed to have a historical final nasal

¹⁸It is important to observe that *hə* is also used as the common affirmative ‘yes’ as well as a frequent filler word. In most cases these can be told apart from true determiners by context and the Russian gloss given.

(Mattissen 2003: 42) and it usually attracts plosive-initial suffixes and head nouns (Nedjalkov & Otaina 2013: 16–17). These phrases are from a story in SMNL 1, from the same speaker, VI. In (31a), she uses the dative ending *-rox*, while in (31b) a plosive-initial suffix is retained.

- (31) a. *hə + umgu-rox*
 that + woman-DAT
 ‘to that woman’
- b. *har e-rx jocjos-c*
 so 3SG-DAT ask-IND
hə + umgu-tox
 that + woman-DAT
 ‘so she asked the woman’

(Shiraishi & Lok 2002: 30,33)

As a conclusion, it seems that post-sonorant CM is indeed highly variable, to the extent that the guidelines of Table 6 are not really applicable. A notable tendency is the absence of CM after determiners.

5.2. Variation in case of loanwords

As illustrated in section 4.1, the speakers of Nivkh often resort to code-mixing and ad hoc loans from Russian. In my database, I have recorded 140 cases where the CM trigger is a modern loan or a Russian proper name but merely 4 cases where the target is, all of which consist of a Russian lexical item preceded by a Nivkh attribute or determiner. These include no surprises: the initial plosive of the foreign target is retained.

The other number 140 includes all the numerous cases where a case or number suffix is attached to a Russian lexeme or to a phonetically adapted form of one. For simplicity, let us ignore those with a final sonorant, which leaves us with 126 entries. In 114 of these, CM is realised according to the norm, despite the foreign trigger and often interesting language-mixing. The numbers per syntactic construction type are shown in Table 8.

Table 8: Loanword-triggered alternations by construction type. CM = contexts of CM with a foreign trigger without final sonorant; UE = unexpected target sounds in these contexts.

| type | CM | UE |
|------|----|----|
| N | 9 | 5 |
| V | 57 | 4 |
| S | 60 | 3 |

Some examples of the “regular” cases are listed in Table 9. I have usually given a broader context, such as the entire phrase, for illustrative purposes, with the actual trigger-target pair (and the corresponding part of translation) in boldface. The sequence of three numbers in the first column pinpoints the location in SMNL (volume-chapter-row).

Table 9: Regular CM after loanwords.

| where | who | context | translation |
|---------|-----|---|---|
| 3-1-177 | GL | <i>kinosjomk-rox</i> <i>viŋan</i> , <i>jeɣevtot nɾak Zoja-ye</i> | ‘when we went to the film shooting , we were always laughing at him with Zoia ’ |
| 6-4-183 | KA | <i>Vovk</i> + <i>ɣanguæk pile</i> | ‘bigger than Vova’s dogs ’ |
| 6-4-336 | KA | <i>oxotnik-xu</i> <i>xesc</i> <i>vezdexod-yiŋ</i> <i>p^hrət</i> <i>yont ɾot</i> | ‘I asked the hunters to go and fetch it with a cross-country vehicle ’ |
| 6-6-78 | KA | <i>hə</i> <i>jakor^j</i> + <i>pəyira</i> | ‘It had (even) dragged the anchor up. ’ |
| 7-9-29 | VT | <i>malina</i> + <i>romsk</i> <i>c^haj</i> + <i>rave</i> | ‘ drink tea with raspberry (jam)! ’ |

Let us then turn to the deviant examples. In (32), the noun *muzej* ‘museum’ acquires a dative suffix with an initial voiced plosive, as if the noun had a final nasal. The expected dative ending after /j/ would be *-roχ*.

- (32) *həʃ hə-tχ lət-r t^hu, muzej-doχ lət-r*
 DEM that-DAT make-CVB sledge museum-DAT make-CVB
 ‘He was making (a model of) a sledge for the museum.’

(Shiraishi & Lok 2010: 68)

Other comparable instances are found in Shiraishi & Lok (2012: 29) where speaker ON uses the form *truba-gir* ‘with a pipe/chimney’ when referring to the chimney of a Nikvh house. As the stem *truba* is a Russian word, it certainly does not have an elided nasal which would explain the voiced plosive. It is possible that presence of phonemic voiced plosives in

Russian together with a sonorous environment contributes to the selection of the allomorph.

An interesting group are the Russian proper names and other Russian nouns ending with *a*; this final vowel is frequently omitted. In most cases of CM this is irrelevant as the preceding sound often is a plosive (e.g. *Voloʒ(a)-ye* 'and Volodya', *Romanovk(a) + fi* 'live in Romanovka'). The Russian word *bol'nitsa* 'hospital' has as its final consonant an affricate which does not exist in the phoneme inventory of Nivkh. This seems to cause some fluctuation in suffixal allomorphy; in (33a) a fricative-initial suffix is applied, i.e. /ʃs/ treated like a plosive, while in (33b) it seems to be the release part [s] that counts. The examples are from different speakers; it would be interesting to know if they both were consistent in their preferences.

- (33) a. *hapa ʔrk bolnits-rox vi-t*
 then already hospital-DAT go-CVB
 'then I immediately go to hospital'

(Shiraishi & Lok 2008: 64)

- b. *ni hoqo-ŋan ni ʔki-ʃ-ra balnits-tox vi-t*
 1SG do.so-CVB 1SG be.ill-IND-FOC hospital-DAT go-CVB
 'I got sick at the same time and went to the hospital'

(Shiraishi & Lok 2010: 73)

In the following example (34) from SMNL 7, verbal root *fi-* does not undergo Hardening after the Russian object *ofis* 'office'.

- (34) *iv naf ofis + fi-r-um-c, nʔrak hum-c*
 3SG now office + be.located-CVB-be-IND always be-IND
 'She spends a lot of time in her office.' (Shiraishi & Lok 2010: 72)

On the contrary, unexpected Hardening occurs in (35a). KA applies the Russian noun *kruʃka* 'cup', as the primary object for a Nivkh predicate. Interestingly, the object bears Russian case marking but also gets the possessive prefix from Nivkh. For some reason, the plosive-initial variant of the verbal root *vʔys-* 'to throw' is used. This seems to be a sporadic case; in (35b) by VT no unexpected CM is present.

- (35) a. *n-erq-ux equrkiʔ p^hi-krusku + pʔys-c*
 1SG-side-ABL quickly REFL-cup.ACC + throw-IND
 'I threw away my cup immediately.' (Shiraishi & Lok 2009: 26)

- b. *tʰətki* *pʰi-kruʃk* + *ro-r* *vi-r*
 early.morning REFL-cup + carry-CVB go-CVB
 ‘Early in the morning she came with her cup.’

(Shiraishi & Lok 2010: 33)

From Table 8 we can see that *attribute* + *noun* complexes are a bit more resistant to CM, albeit data for them is sparse. They include noun phrases with a Russian demonstrative (*eto* + *qan* ‘this dog’, Shiraishi & Lok 2010: 42), or with an adjective (36). The noun *cʰir* ‘clearing, opening in the forest’ does not undergo Spirantisation.

- (36) *rovnoje* + *cʰir* *jiv-yar*
 flat + clearing be-CVB

‘There was a clearing (in the forest).’ (Shiraishi & Lok 2009: 41)

The absolute figures for loan-triggered CM contexts are rather low for broad generalisations but as a whole, the most common strategy with Russian triggers seems to be mutating the native target regularly, although the counterexamples include some interesting outcomes.

5.3. Other types of variation

Altogether, there were 1270 CM contexts in the database not involving a final sonorant or a foreign lexeme. The vast majority of these, 1188, followed the norm (Table 6). In this section, I will present some of the remaining 82. An example of unexpected non-application of CM is the following:

- (37) *siʃ* + *qʰal*
 what + clan

‘Which clan?’ (Shiraishi & Lok 2002: 11)

Notably, the speaker (GL) stutters in this question, which according to the norms should be *siʃ* + *χal*. The plosive could be explained by the situation where she was searching for the right word, or possibly she produced it as an accidental slip.

In a conversation where species of fish are listed in Shiraishi & Lok (2012: 31), ON uses a plural form *temra-ku* ‘rudds’. There is no dictionary evidence of *temra* having an elided nasal (though there are similar-sounding words that do), and the voicelessness of the plosive begs for explanation anyway.

Let us take look at a potential lexical exception in CM:

- | | | | |
|---------|--|----|---|
| (38) a. | <i>ma + potək</i> dried.fish + upper.part 'the upper part of dried fish' (Shiraishi & Lok 2002: 41) | b. | <i>ma + pasq</i> dried.fish + half 'half of a dried fish' (Shiraishi & Lok 2004: 71) |
|---------|--|----|---|

Both (38a) and (38b) look like a case of nasal-blocked Spirantisation, but *ma* is a common word which is not known to have had a final nasal. The examples come from different speakers, and both *potək* and *pasq* should be expected to alternate regularly. Anyway, the lexical item *ma* looks like having a tendency to block CM; the phrase *ma + pasq* is attested also in SMNL 7 (Shiraishi & Lok 2010: 40), from yet another speaker, as well as in Panfilov (1965: 249).

There are also a couple of cases involving the verb *fur-*, such as *siɣ-vak + p^hur-ɟ* 'something was said' (Shiraishi & Lok 2002: 18). Here, however, *vak* is a contraction of what is, in Mattissen's terms, a scalar operator *vark* (with CM-conditioned variants *park*, *bark*) 'only', which has its origins in the verbal derivative *-vark-c* 'to be contained exclusively' (Mattissen 2003: 82). This raises a question if there could be a historical participial ending *-ŋ* triggering the Hardening of the verb for some speakers. Also, as the plosive-initial forms can be seen as underlying (see section 3.2), there could be potential among speakers to occasionally revert to them even in case of transitive verbs when they are not citation forms.

In section 3.5, I presented a few phrases which were observed, for some speakers, to prompt inconsistent CM in elicitation. In SMNL, the lexical items found in these phrases were generally not exceptional in any way. However, I found one occurrence of the form *q^haχ-yir* 'with a spear' (expected: *q^haχ-kir*; Shiraishi & Lok 2007: 58), as well as the following conversation between GI and the author Shiraishi (HS):

- (39) GI: ...*raq + vəŋx + ni-c. taʁori siɣ vək-c-lu raq + vəŋx*
 rice + soup + eat-IND not.know what mix-IND-Q rice + soup
 '... he ate rice soup. I don't remember what else there was in it.'
- HS: *raq + vəŋx?*
 rice + soup
 'Rice soup?'

GI: *raq + pəŋx, hə. raq + vəŋx + ni-gu-c.*
rice + soup yes rice + soup + eat-CAUS-IND

‘Yes, rice soup. We gave him rice soup to eat.’

(Shiraishi & Lok 2008: 76)

GI mostly uses the standard form *raq + vəŋx* but once, in an affirmative reply to HS, utters *raq + pəŋx*. It is possible that this is due to the setting; GI confirms the term ‘rice soup’, and to make sure to get understood, uses a compound of the citation forms.

Uncertainty or hesitation about the preferred allomorph, observed in field elicitations of section 3.5, is occasionally evident in SMNL as well. In the following (40), LI first uses the fricative-initial suffix instead of the expected *-ku* but quickly corrects himself.¹⁹

(40) *Aqr-xu hum-ta, Aqr-ku...*
Akr-PL live-FOC Akr-PL

‘The family of Akr lived (there), Akr...’ (Shiraishi & Lok 2007: 17)

In (41), LI describes seal hunting with the phrase *kita + qost*.²⁰ GL repeats it with a fricative-initial citation form of the verb, to which LI then also adapts. Actually, the expected form should probably be *kita + gost* as the ESD variant of the noun (or actually the only one listed in the dictionary) is *kitaŋ* (Savelyeva & Taksami 1970: 114).

(41) LI: ...*kita + qos-t, lanŋ + k^hu-t^ha-c.*
seal.trap + put-CVB seal + kill-USIT-IND

‘... they set traps (in holes in the ice) for hunting seals.’

GL: *kita + vos-t.*
seal.trap + put-CVB

‘They set traps.’

LI: *kita + vos-t.*
seal.trap + put-CVB

‘Yes, they set traps.’ (Shiraishi & Lok 2007: 5–6)

¹⁹In the transcription, both are written as *Aqr-ku* but the fricative is clear when listening to the recording.

²⁰Like in (40), the transcription follows the norms of the language, having /v/, but the sound file reveals a plosive.

The following example (42) is puzzling: the phonological context in *Laŋrix p^hiŋyu* is in favour of Hardening, but if the word-final *-x* is analysed as an ablative case marker, the phrase does not form a syntactic complex, and can even be considered ungrammatical as the verb *fi-* normally requires the location argument as the primary object (*Laŋri + fiŋyu*). The final *-x* may also be a contamination of the Russian locative expression *na Langrax* ‘in Langri’, and this is probably the most attractive interpretation, as also a dative formation *Laŋrix-tox* (Shiraishi & Lok 2004: 8) is attested.

- (42) *Keŋan-yu Laŋri-x(+)p^hi-ŋyu*
 Kekhan-PL Langri-ABL?(+)live-IND-PL
 ‘The family of Kekhan lived in Langri.’ (Shiraishi & Lok 2004: 4)

In Table 10 below I have listed 30 other CM deviations with no post-sonorant context or loanword in the trigger position accounting for the anomaly. The notational practices used should be familiar from Table 9.

Table 10: Instances of unexpected CM behaviour.

| where | who | context | translation |
|---------|-----|---|--|
| 1-4-8 | ON | <i>tik miux-ye rake coŋxcoŋxux-ye lel</i> | ‘in the beds, in the corners, somewhere’ |
| 1-4-159 | VI | <i>p^hi kujva-kiŋ hə umguax iysguŋ</i> | ‘slipped his ring on the woman’ |
| 1-4-177 | VI | <i>hə e-giŋ, alvre hartox p^həys hapa</i> | ‘then she threw the comb backwards’ |
| 3-1-24 | VX | <i>əz + vevuguta, ma vevuguta</i> | ‘they separated the spine from the fish’ |
| 3-1-244 | GL | <i>c^huy envara kuyi-gu jestⁱ, ŋto li?</i> | ‘so you also have Ainu blood?’ |
| 3-5-11 | VX | <i>kakoj eto ar + so, ar so havuru</i> | ‘what’s that, a male fish, wait, no...’ |
| 3-5-28 | VX | <i>jarnəŋ covocŋan a eto als + xəzət</i> | ‘feeding (a bear) is hard, burying the berries...’ |
| 3-5-136 | VX | <i>həŋ p^hrəŋ, c^hxəŋ coŋŋ + voŋan</i> | ‘he came, seizing the head of the bear’ |

| | | | |
|---------|----|--|---|
| 4-1-59 | LI | <i>ɲər + yulc hat ɪt^hac</i> | ‘it is called “ to cut the hole ”’ |
| 4-1-66 | LI | <i>hoŋgur ɲər + yult^hac</i> | ‘that’s how they cut the hole ’ |
| 4-1-90 | ON | <i>lanr nonoqxu iɲəyr + χaut</i> | ‘ the fur of a baby seal was dried ’ |
| 4-1-123 | GL | <i>c^holɲi + t^hxopr</i> | ‘he bred reindeer’ |
| 5-1-332 | ON | <i>t^hu + c^harc forɣara</i> | ‘so, they loaded the sled full ’ |
| 5-1-433 | ON | <i>ɲr̥or viɲan als + fet iɲte</i> | ‘took me to pick berries and eat them’ |
| 5-1-434 | ON | <i>als + fet ɲt</i> | ‘ picked berries and ate them’ |
| 5-1-518 | ON | <i>manɲu-guux ɣek</i> | ‘got them from the Chinese ’ |
| 5-2-34 | GI | <i>ɲæk-ku tæmkxu sæk qoc</i> | ‘hands and feet hurt’ |
| 5-2-123 | GI | <i>orroax caχ + vayguɲu</i> | ‘(ordered) brother-in-law to prepare ritual shavings ’ |
| 5-2-124 | GI | <i>c^ham itɲan jax hæ caχ + vaygurra</i> | ‘shaman told him to prepare ritual shavings ’ |
| 5-2-125 | GI | <i>haɲan hæ caχ + vayguc cəj</i> | ‘then he began to prepare ritual shavings ’ |
| 5-2-352 | GI | <i>loci + c^hamyu vəyvəykuj</i> | ‘didn’t trust Russian doctors ’ |
| 6-4-71 | KA | <i>hæc josq-tox jax vetrungur q^hac</i> | ‘he shot at its face ’ |
| 6-4-150 | KA | <i>eri + tukr̥ p^hit, ɲi</i> | ‘I was sitting on this side of river ’ |
| 6-4-253 | KA | <i>ciyr + volutot, ɲaqr polkutra</i> | ‘we shook the tree , one tree’ |
| 6-4-354 | KA | <i>muyv ɲaqr t^hor + xute haqur</i> | ‘they could kill five (bears) in a day’ |
| 7-2-91 | GI | <i>hə vəzyals qaqf + vəlktə</i> | ‘we made vyzghals with bunchberries ’ |

| | | | |
|----------|----|---|------------------------------------|
| 7-10-2 | GI | <i>c^{hi} hontq jaqr + ʒor</i> <i>vija</i> | ‘take them in (one) bag with you’ |
| 10-13-28 | LI | <i>magazin leba + p^hibar</i> <i>hemaxax</i> | ‘the woman lived near the store’ |
| 10-15-76 | ON | <i>məuc + q^hauc</i> | ‘it is called <i>məuc</i> ’ |
| 10-17-47 | ON | <i>q^hasku janpa-ku k^hirt</i> | ‘they wear shaman drums and belts’ |

Of these, 19 involve transitive verbs which fail to undergo Hardening. As many as seven begin with /v/, which may derive from the original /w/ (recall section 2.4), in which case it does not alternate. Furthermore, Panfilov (1962: 15–16) reports that some transitive verbs exceptionally do not participate in CM. Then again, various other occurrences in SMNL data show that *fe-* ‘to pick’ (5-1-433,434) or *xu-* (*i-γ-*) ‘to kill’ (6-4-354) clearly are not such verbs. These, as well as most other phrases in Table 10, beg for explanation.

To be honest, identifying the CM variant of alternating consonants from the recording can at times be challenging, especially when confronted with consecutive phonetically similar sounds at the morpheme boundary. In fast speech the sounds tend to coalesce, leaving the result open for interpretation. Example (43) shows two problematic cases as they are transcribed in SMNL.

- (43) a. *mləc + ciyr*
bench + wood
‘wooden bench (of a boat)’ (Shiraishi & Lok 2013: 27)
- b. *siʒ + c^hχa-yir* *j-uski-c*
what + money-INS 3SG-pay-IND
‘With what money could we pay?’ (Shiraishi & Lok 2013: 68)

The phrase in (43a) should regularly be represented as *mləc + ziyr*, which it actually may be, but given the affricate-like character of /c/, it is difficult to distinguish [cz] or [cs] from [c:]. In (43b), /ʒ/ in *siʒ* sounds like changing straight to /χ/, as if omitting /c^h/ or supposed /s/ in between.

It is not possible to find any common motivation for all the atypical CM realisations listed in this section. Sometimes, however, hesitation or

uncertainty of the correct form is clearly observable (37, 40, 41). This could be a sign of decay in the CM production of the speakers.

In the following sections, I will examine the tendencies of CM with respect to syntactic environment, speaker, and triggering sounds. Because of the great importance of an overt or elided final sonorant in the triggering morpheme, I have mostly counted separately those instances of CM where this sonorant is present or reconstructed and those where it is not.

5.4. Differences between construction types

Table 11 sorts the statistics of CM anomalies by the construction type, as well as by the presence or absence of a final sonorant in the trigger.

Table 11: Alternations by construction type. CMS = post-sonorant (including elided nasals) contexts of CM; UES = unexpected post-sonorant target sounds; CM = contexts of CM without a final sonorant in the trigger; UE = unexpected target sounds in these contexts.

| type | CMS | UES | CM | UE |
|------|-----|-----|-----|----|
| N | 260 | 123 | 155 | 22 |
| V | 176 | 124 | 518 | 32 |
| S | 524 | 219 | 724 | 40 |

We can easily observe that in post-sonorant context, the “unexpected” initial sounds in the target are very common, as was already demonstrated in section 5.1. In case of *object + verb* complexes, they are even more frequent than the expected sounds suggested earlier in Table 6. Voiced fricatives often do not undergo Hardening to plosives (as demonstrated earlier in [27]), or, conversely, voiceless fricatives do (25).

Even *attribute + noun* complexes and suffixes have post-sonorant violation rate of more than 40 % against rules presented in Table 6, meaning that in these contexts we indeed should speak of CM tendencies, at most, rather than rules.

In other contexts, CM is realised much more faithfully. From columns CM and UE in Table 11 we can calculate that 6.2 % of verbs and 5.5 % of suffixes show an unexpected CM allomorph. Especially with *object + verb* complexes the contrast to post-sonorant contexts is striking. For head nouns, the rate is somewhat higher, 14.2 %.

5.5. Differences between speakers

Table 12 lists the number contexts calling for (or, perhaps more appropriately, permitting) a voiced initial plosive for each speaker, compared to the number how often a voiced plosive actually is surfaced. Most speakers apply voicing in about half or slightly fewer of occasions. A clear exception is GI, who applies voicing in post-nasal plosives roughly in 70 % of all cases.

Table 12: Realisation of initial voiced plosives. Speaker (sex, year of birth); VE = voiced plosive in CM target expected; VR = voiced plosive in CM target realised.

| Speaker | VE | VR |
|--------------|-----|-----|
| GI (F, 1944) | 178 | 125 |
| ON (F, 1915) | 129 | 39 |
| GL (F, 1946) | 83 | 31 |
| VX (F, 1929) | 80 | 37 |
| KA (M, 1936) | 74 | 35 |
| LI (M, 1942) | 58 | 20 |
| VI (F, 1946) | 55 | 14 |
| ZL (F, 1946) | 11 | 5 |
| NV (F, 1941) | 11 | 5 |
| VT (F, 1941) | 8 | 6 |
| VK (F, ?) | 7 | 3 |
| SP (F, 1943) | 3 | 1 |

For other speakers, plosive voicing is attested mainly in suffixes and especially in frequent expressions such as *nivy-gu* ‘(Nivkh) people’ or *imη-dox* ‘to them’.

As post-sonorant CM is clearly unpredictable, it is perhaps more interesting to compare speakers’ performance in other contexts. Table 13 presents statistics for contexts not involving a final sonorant.

Let us, for the sake of representativeness, just look at the top seven speakers who have more than one hundred entries each. Of these, VI has the lowest “mistake rate”, 4.1 %. This may be affected by the speech situation: she is telling stories, not participating in a spontaneous conversation.

Perhaps a bit surprisingly after the voicing data in Table 12, the highest rate is measured for GI (8.9 %).

Table 13: Realisation of target sounds in other than post-sonorant CM. Speaker (sex, year of birth); CM = number of non-sonorant CM contexts; UE = number of unexpected target sounds with respect to Table 6.

| Speaker | CM | UE |
|--------------|-----|----|
| ON (F, 1915) | 302 | 23 |
| GI (F, 1944) | 270 | 24 |
| KA (M, 1936) | 179 | 10 |
| GL (F, 1946) | 159 | 10 |
| VI (F, 1946) | 145 | 6 |
| LI (M, 1942) | 141 | 8 |
| VX (F, 1929) | 108 | 8 |
| VT (F, 1941) | 33 | 3 |
| ZL (F, 1946) | 17 | 2 |
| SP (F, 1943) | 15 | 0 |
| NV (F, 1941) | 14 | 0 |
| VK (F, ?) | 7 | 0 |
| KC (F, ?) | 7 | 0 |

Summarising the results, there does not seem to be major differences between speakers. It is perhaps a bit surprising that the CM misapplication rate does not seem to correlate with age. For example ON, who is about one generation older than the other informants, does not really stand out.

5.6. Sound-specific differences

Table 14 describes CM realisation for various base sounds. The line dividing the table in half is not just for readability: setting apart plosives and fricatives it is also the boundary of noun phrases and verb phrases, as well as of Spirantisation and Hardening.

Table 14: Sound-specific CM deviances. Base sound = initial sound of the target (citation form); FS = number of post-sonorant CM contexts; US = number of unexpected post-sonorant target sounds; FN = number of other CM contexts; UN = unexpected target sounds in these contexts.

| Base sound | FS | US | FN | UN |
|----------------|-----|-----|-----|----|
| p | 28 | 25 | 23 | 4 |
| p ^h | 2 | 0 | 0 | 0 |
| t | 151 | 86 | 215 | 5 |
| t ^h | 13 | 0 | 25 | 3 |
| c | 21 | 18 | 18 | 1 |
| c ^h | 90 | 4 | 31 | 6 |
| k | 432 | 192 | 517 | 36 |
| k ^h | 6 | 1 | 12 | 0 |
| q | 20 | 16 | 11 | 2 |
| q ^h | 19 | 0 | 20 | 5 |
| v | 17 | 10 | 38 | 8 |
| f | 36 | 31 | 150 | 9 |
| r | 8 | 7 | 40 | 0 |
| r̥ | 39 | 30 | 55 | 5 |
| z | 0 | 0 | 13 | 0 |
| s | 15 | 5 | 54 | 3 |
| ʃ | 23 | 16 | 41 | 3 |
| x | 25 | 18 | 52 | 3 |
| β | 3 | 3 | 14 | 0 |
| χ | 12 | 4 | 70 | 1 |

In addition to CM tendencies, Table 14 reveals details about the Nivkh language and some consequences of the methodology of this study. The bulk of entries with base sound /k/ is not surprising due to suffixes like plural *-ku*, instrumental *-kir*, comitative *-ke*, to name the most frequent ones.

The aspirated plosives /p^h t^h k^h q^h/ after sonorants are very stable; they are not expected to spirantise and they do not; there are only 3 unexpected target sounds for 130 base sounds of this class. These are *qan + xiri* in (30b) above and the two /s/'s in (44), where the effect of the elided nasal in *pavla* (< **pavlan*) is absent: after it, the normal outcome would be the citation form *c^hχa*.

- (44) *paxla + sxα tridtsat rublej haki ku + paxla + sxα,*
 be.red + money thirty roubles so that + be.red + money,
həj-yir̥ ye-ya ɛxali ye-c
 that-INS get-CVB much get-IND
 ‘The red bill was 30 roubles and you could buy many things with it.’

(Shiraishi & Lok 2012: 52)

Non-aspirated plosives, on the other hand, often fail to produce the predicted sound after sonorants; for /p/, we get 25 unexpected target sounds of 28 total, for /c/, 18 of 21, etc. This is not as dramatic as it first looks, as the explanation for most of these cases is the lack of voicing (i.e. not, for example, Spirantisation to a fricative). The most frequent sounds of this class, /t/ and /k/, acquire voicing a bit more often; it seems that in suffixes, where they often occur, voicing is not as rare as in head nouns.

Mattissen (2003: 51–53), referring to Krejnovich (1937: 62), suggests that if the surface representation of the trigger ends in a voiceless plosive, a voiceless initial plosive in the target is totally predictable since “phonotactics do not allow plosive or fricative + plosive clusters of unequal voice”. Indeed, this is a valid point which my crude classification failed to capture, and there are a handful of affected cases in the data (e.g. *uryət + qan* ‘healthy dog’ < **uryət + gan* < **uryətŋ + gan*; Shiraishi & Lok 2008: 82), but voicelessness is common in other surface contexts as well, especially after demonstratives as was shown in section 5.1.

I was also planning to examine whether Mattissen’s (2003) view of /l/ and often also /m/ as strong (functionally plosive-like) sonorants is justified in the light of SMNL data. There is indeed variation after /m/ and /l/, but most lexemes ending in these sounds also happen to have an elided nasal (which is weak by definition) after the /m/ or /l/ (e.g. *kil* < **kilŋ* ‘Evenki’; *c^ham* < **c^hamŋ* ‘shaman’; *q^hal* < **q^halŋ* ‘clan’). Admittedly, Mattissen (2003: 46) is also aware of this problem. Excluding those, the remaining complexes with a triggering /l/ or /m/ are too few in number for drawing reasonable conclusions.

After non-sonorants, unexpected alternations of /p t c q/ are few, and most of them have actually been mentioned in glossed examples. For /k/ they are more numerous, often arising from fluctuation of the fricative quality in four-allomorph suffixes such as the plural *-ku/-yu/-gu/-xu*. Usually /ɣ/ is found where /x/ would be expected, e.g. *hisk-yir* ‘with a thread’ (Shi-

raishi & Lok 2007: 63); *ip^hulk-yu* ‘its legs’ (Shiraishi & Lok 2010: 69); *ətək-ye* ‘father-COM.DU’ (Shiraishi & Lok 2012: 48). It seems that sometimes, preference for /y/ as the regular alternating pair of /k/ overrides the assimilative devoicing. However, at least one example of unexpected devoicing is also found: *nemla-xunu* ‘lenok-COM.PL’²¹ (Shiraishi & Lok 2012: 32).

Concerning /k/, there are also a couple of cases of Spirantisation after velar or uvular fricatives, like the already mentioned *q^hax-yir*, and ablative-comitative sequences such as *C^hɪŋgai-uy-ye* (Shiraishi & Lok 2008: 26) or 1-4-8 in Table 10. This is possibly after the model of successive fricatives produced by Velar/Uvular Spirantisation (see the end of section 3.2). For the latter, it is also worth noticing that the unmarked order is actually the comitative preceding the case suffix (Nedjalkov & Otaina 2013: 57). This may be reflected in the allomorphy even in the opposite situation.

For fricatives beginning transitive verbs, the picture is not too different from what was observed for plosives. The column US includes the post-sonorant cases where a voiced fricative is not affected by Hardening, those where a voiceless fricative is, as well as those where the resulting plosive is voiceless. The real exceptions (column UN) are again rare, affecting chiefly initial /v/ and /f/. For the latter, the amount of exceptions is not significantly high in proportional terms, as some /f/-initial verbs are very frequent; for /v/, the explanation often lies in the merger of /w/ and /v/ which has resulted in non-alternating initial /v/’s.

In short, the differences in initial obstruents’ probability of undergoing CM are mostly small, apart from /k/ and /v/. For triggers not ending in a sonorant, the absolute figures are also rather low to justify proportional comparison.

6. Discussion

6.1. Summary of the results

The objective of this study was to observe the current state of CM and search for unexpected application (or non-application) of it. It turned out that most of the deviations from the canonical CM pattern could be attributed to the well-known post-sonorant variation, or were limited to presence or absence

²¹A species of fish, *Brachymystax lenok*.

of plosive voicing which barely is a contrastive feature in Nivkh. As we saw, there were some other anomalies as well: non-alternating forms, searching for the right allomorph, plosive-initial transitive verbs where Hardening was not expected, and so on.

However, the unconventional forms were not as frequent than I had assumed after my observations in the field. Although SMNL only has two informants in common with my field experiment, this points to a conclusion that elicitation of short phrases can lead speakers to omit CM or otherwise produce forms that do not occur in their “normal” speech. To the question “Is CM more systematic in conversation than in elicited phrases?” I can now answer affirmatively.

Answers to the other three questions set up in the introduction were sought in sections 5.4, 5.5, and 5.6. My initial hypothesis derived from the field results was that suffixal alternation should be more stable than CM in syntactic complexes. The numbers in section 5.4 showed, however, that suffixes do not stand out in this respect; rather, *attribute + noun* complexes contain proportionally slightly more unexpected alternants than the other types. In post-sonorant contexts the *object + verb* type has the most counterexamples to the selected CM scheme (i.e. Gruzdeva 1997a: 92), but this variation itself is already known and cannot be attributed to recent change in the language.

In a community undergoing a language shift from L1 to L2, the main parameter correlating positively with L1 proficiency is typically age. Thus, one could have expected older speakers to apply CM more regularly than the relatively young ones. However, in section 5.5, although no rigid statistical analysis was performed, I could conclude that the oldest speakers were actually not more systematic than others, and in any case the speaker-specific differences were minor. Post-sonorant plosive voicing seemed like a freely varying feature for most speakers, although one speaker had a clear preference for it. This variation was also noticed in section 5.6. For other CM contexts, however, no significant sound-specific differences could be discovered, partly due to the relatively low absolute number of exceptional CM instances.

It seems that plosive voicing after sonorants is not as obligatory as sometimes is presented in literature. While authors often admit the unpredictability of post-nasal alternation in their descriptions of CM, they virtually always transcribe post-nasal plosive voicing in their glossed examples.

From Table 13 we could see that the proportion of unexpected CM target sounds varied roughly from 4 to 9 % for the main informants, SMNL data as a whole averaging slightly below 7 %. Is this much? One could argue that it is, given that the people who share their knowledge in SMNL have obviously been selected among the most proficient speakers. Then again, the numbers do include some debatable cases, as well as potential exceptions in the lexicon.

There seems to be no widespread, systematic patterns of non-application of CM in the speech data of SMNL, but there sure is some inconsistency. The Nivkh spoken by the informants certainly shows some features characteristic to an obsolescent language, including gaps in vocabulary and heavy code-switching and ad hoc borrowing from Russian. Some of these traits, such as loss of numeral classifiers, are indeed attritional. These can affect CM indirectly; for example, by mixing up the argument structure of ditransitive verbs. It seems, though, that Consonant Mutation is such an integral part of the language system that it is not the spearhead of attrition in Nivkh, at least in the generation that is still clearly capable of using the language in conversation. Without similarly organised older data for comparison, we cannot know for sure.

There were, of course, some qualitative differences between speakers. For example, the hesitant sentences (25) and (37) were produced by speaker GL who participates in some conversations but is not the main informant in any volume, probably due to her lower proficiency in the language. Most of the speakers who showed inconsistent application of CM in my field elicitation are younger than those in SMNL. As these inconsistencies are mostly absent in the older generation's speech, this could be either a sign of attrition or an anomaly arising from the elicitation setting. It has also been proposed (Shiraishi 2006, see section 3.2) that the motivation for CM is perceptual, which could partly explain its absence in short elicited phrases as well as in the younger generation's language: if a speaker is not capable of forming very long sentences, the significance of CM in parsing sentences into syntactic and phonological units is also reduced. The basic problem of

this kind of study is that variation is easy to prove, while attrition, or any other motivation behind the variation, is not. For example, it is conceivable that synchronically opaque rules of CM after elided nasals would gradually be eliminated in a healthy language just as well.

I conclude, albeit cautiously, that most of the exceptional CM documented in this study can be explained by natural variation, since it was attested on all informants with minor differences in frequency and the totally unexplainable cases were relatively few. Occasional signs of uncertainty in CM were observed on some speakers, but these were not enough to prove systematic decay in this sector of the language.

6.2. Concluding remarks

Finally, I will make some comments on the methodology used, as well as discuss potential ideas for future research.

The most time-consuming part of the study was gathering the data for the database, since it included listening through all the recordings to see if the transcription matched the phonetic reality at the CM boundaries. But it was worth the effort: quite often, the transcription had the normatively correct form but something else was actually pronounced. On the other hand, “false alarms” were also encountered: what looked like a CM exception turned out to be a mistranscription or a typo. The transcription proved particularly unreliable in velar and uvular consonants: for example, <ɾ> /g/ and <ɸ> /ɣ/ got often mixed up.

I have to admit that my personal command of the Nivkh language is limited and superficial to such an extent that I may well have missed some syntactic complexes that would deserve attention or at least being listed in the database. It is also more than possible that the over 2 300 database entries include some dubious or even incorrect interpretations. Being aware of this, I count on that these cases are sporadic enough not to result in any bias in the results as a whole.

For sake of completeness, it could be a good idea to continue the study with the three remaining volumes of SMNL. A possible extension would be including all case suffixes and postpositions and comparing their CM behaviour; I must admit, though, that I did not find any clues of significant differences among suffixes in the course of the present study. Another enhancement would be to include more sociolinguistic parameters, by record-

ing new material with informants from different dialect groups (at least ESD) and with more heterogeneous backgrounds.

Beyond CM and SMNL, one potential research topic could possibly be Nivkh-Russian bilingualism and the interplay of the languages. In section 5.2, we saw how CM interacts with Russian lexemes, and samples of code-mixing were presented at least in examples (16, 17, 18). It could be interesting to study when and how the speakers mix the languages, as all remaining speakers probably do it when speaking Nivkh. The main problem is that all of the Nivkh community today has Russian as their primary language of communication, which would make the setting quite artificial. Shiraishi & Botma (2015: 210) estimate that the number of Nivkh speakers fluent enough to serve as language consultants is currently “no higher than 50”. Whatever aspect of Nivkh we wish to study making use of native knowledge of the language, there is no time to waste.

Abbreviations

| | |
|--------|---------------------------------------|
| ABL | ablative case |
| ACC | accusative case |
| AD | Amur Dialect |
| ADVERS | adversative mood |
| CAUS | causative |
| CL | classifier |
| CM | Consonant Mutation (in Nivkh) |
| COM | comitative |
| COORD | coordinating suffix |
| CVB | converb |
| FOC | focus |
| DAT | dative case |
| DU | dual |
| ESD | East Sakhalin Dialect |
| ESG | East Sutherland Gaelic |
| EXCL | exclusive |
| F | feminine |
| ICM | Initial Consonant Mutation |
| IND | indicative |
| INS | instrumental case |
| IPA | International Phonetic Alphabet |
| NSD | North Sakhalin Dialect |
| OFS | old fluent speaker(s) |
| PFV | perfective |
| PL | plural |
| REFL | reflexive |
| Q | question marker |
| SG | singular |
| SM | Soft Mutation (in Celtic) |
| SMNL | Sound Materials of the Nivkh Language |
| SS | semi-speaker(s) |
| SSD | South Sakhalin Dialect |
| SUP | supine |
| USIT | usitative |
| WSD | West Sakhalin Dialect |
| YFS | young fluent speaker(s) |

Excerpt from the database

| SMNL | volume | chapter | row | collocation | gloss | base | expect | realize | envirc | trigge | targv | final | speaker | notes |
|------|--------|---------|-----|---------------------|---------------------|------|--------|---------|--------|--------|-------|-------|---------|--|
| 6 | 6 | 6 | 43 | Somk-a-rox | Somka-DAT | t | r | r | S | 1 | 0 | 0 | 0 KA | a clipped? |
| 6 | 6 | 6 | 44 | Imy-u-tox | they-DAT | t | d | t | S | 0 | 0 | 0 | 1 KA | |
| 6 | 6 | 6 | 47 | c'ɲaf p'urnəjan | talk about bears | f | p' | p' | V | 0 | 0 | 0 | 0 KA | |
| 6 | 6 | 6 | 51 | ar'-tox | mouth.of.river-DAT | t | d | t | S | 0 | 0 | 0 | 1 KA | |
| 6 | 6 | 6 | 54 | parq xuc | caught sturgeon | x | x | x | V | 0 | 0 | 0 | 0 KA | transcribed p'arɣ |
| 6 | 6 | 6 | 54 | ke kost | set up fish net | ʁ | ʁ | ʁ | V | 0 | 0 | 0 | 0 KA | |
| 6 | 6 | 6 | 55 | erimi rulkut | put in the river | r | r | r | V | 0 | 0 | 0 | 0 KA | |
| 6 | 6 | 6 | 59 | jakor qosc | set up an anchor | ʁ | q | q | V | 1 | 0 | 0 | 0 KA | |
| 6 | 6 | 6 | 61 | tyr tovtə | bound to a stake | r | t | t | V | 0 | 0 | 0 | 0 KA | |
| 6 | 6 | 6 | 64 | erimi rulkut | put in the river | r | r | r | V | 0 | 0 | 0 | 0 KA | |
| 6 | 6 | 6 | 67 | p'so-yu | my fish | k | y | y | S | 0 | 0 | 0 | 0 KA | |
| 6 | 6 | 6 | 73 | ɳarq-xu | my sturgeons | k | x | x | S | 0 | 0 | 0 | 0 KA | |
| 6 | 6 | 6 | 74 | ulaf-t'xarɣ | onto the hill | t' | t' | t' | S | 0 | 0 | 0 | 0 KA | check 5:40 |
| 6 | 6 | 6 | 75 | parq-xu | sturgeons | k | x | x | N | 0 | 0 | 0 | 0 KA | |
| 6 | 6 | 6 | 75 | p'ile p'arqxu | big sturgeons | p' | p' | p' | N | 0 | 0 | 0 | 1 KA | |
| 6 | 6 | 6 | 77 | ulaf-tox | hill-DAT | t | t | t | S | 0 | 0 | 0 | 0 KA | |
| 6 | 6 | 6 | 78 | jakor payira | dragged the anchor | v | p | p | V | 1 | 0 | 0 | 0 KA | |
| 6 | 6 | 6 | 79 | tal'f-tox | far-DAT | t | t | t | S | 0 | 0 | 0 | 0 KA | |
| 6 | 6 | 6 | 83 | ulaf-t'xətoɣ | onto the hill | t | t | t | S | 0 | 0 | 0 | 0 KA | |
| 6 | 6 | 6 | 83 | ulaf-t'xətoɣ | onto the hill | t' | t' | t' | S | 0 | 0 | 0 | 0 KA | |
| 6 | 6 | 6 | 86 | vizax-ku | hill-DAT | t | t | t | S | 0 | 0 | 0 | 0 NV | |
| 6 | 6 | 6 | 86 | vizax-ku | roots | k | k | k | S | 0 | 0 | 0 | 0 KA | |
| 6 | 6 | 6 | 90 | p'soyu yet | dug out my fish | y | ʁ | y | V | 0 | 0 | 0 | 1 KA | |
| 6 | 6 | 6 | 90 | p'so-yu | my fish | k | y | y | S | 0 | 0 | 0 | 0 KA | |
| 6 | 6 | 6 | 99 | jax-ku | them | k | k | k | S | 0 | 0 | 0 | 0 KA | |
| 6 | 6 | 6 | 102 | jayz c'o | unfamiliar fish | c' | c' | c' | N | 0 | 0 | 0 | 1 NV | |
| 6 | 6 | 6 | 103 | jayz c'o | unfamiliar fish | c' | c' | c' | N | 0 | 0 | 0 | 1 KA | |
| 6 | 6 | 6 | 105 | c'oyu t'xopinar' | catching fish | r' | r' | t' | V | 0 | 0 | 0 | 1 NV | check also 07:00 - sounds like t missing |
| 6 | 6 | 6 | 105 | c'o-yu | fish-PL | k | y | y | S | 0 | 0 | 0 | 0 NV | |
| 6 | 6 | 6 | 105 | ha c'oyu | these fish | c' | c' | c' | N | 0 | 0 | 0 | 1 NV | |
| 6 | 6 | 6 | 107 | ena c'oyu | other fish | c' | c' | c' | N | 0 | 0 | 0 | 1 NV | |
| 6 | 6 | 6 | 107 | c'o-yu | fish-PL | k | y | y | S | 0 | 0 | 0 | 0 NV | |
| 6 | 6 | 6 | 113 | sesqxu set'ənan | setting up the nets | s | s | s | V | 0 | 0 | 0 | 1 KA | |
| 6 | 6 | 6 | 113 | sesq-xu | nets | k | x | x | S | 0 | 0 | 0 | 0 KA | |
| 6 | 6 | 6 | 114 | cesq-xu | nets | k | x | x | S | 0 | 0 | 0 | 0 KA | |
| 6 | 6 | 6 | 114 | ha cesqxu | this fishnet | c' | c' | c' | N | 0 | 0 | 0 | 1 KA | |
| 6 | 6 | 6 | 126 | cesq yaxvuxaxcuyərc | damage the fishnet | v | v | v | V | 0 | 0 | 0 | 0 KA | |
| 6 | 6 | 6 | 127 | lotiyu cesq | Russians' fishnet | c' | c' | c' | N | 0 | 0 | 0 | 1 KA | |
| 6 | 6 | 6 | 127 | loti-yu | Russian-PL | k | y | y | S | 0 | 0 | 0 | 0 KA | |
| 6 | 6 | 6 | 128 | leska-yu | fishing line-PL | k | y | y | S | 1 | 0 | 0 | 0 KA | transcribed ɡ |

Transcription

| SMNL | IPA | SMNL | IPA |
|------|----------------|------|----------------|
| а | a | нѣ | ɲ |
| б | b | ѣ | ɲ |
| в | v | о | o |
| г | g | п | p |
| г̣ | ɡ | п' | p ^h |
| ѣ | ʏ | р | r |
| ѣ̣ | ɸ | р̣ | ṛ |
| д | d, ɟ | с | s |
| дѣ | ɟ | т | t, ʈ |
| е | je, e | тѣ | ʈ |
| ѣ̣ | jo, o | т' | t ^h |
| з | z | у | u |
| и | i | ф | f |
| й | j | х | x |
| к | k | х̣ | χ |
| к' | k ^h | х | h |
| к̣ | q | ч | ʃ ^h |
| к̣' | q ^h | ы | ɐ |
| л | l | э | e |
| м | m | я | ja, a |
| н | n, ɲ | ю, | ju, u |

Practices of Russian orthography are followed e.g. in that **тя** = **тѣ** + **а** = /ca/. The hard sign **ѣ** is used for closing the syllable between a consonant and a iotified vowel (e, ѣ, я, ю).

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