

# Nganasan loanword phonology: A typological approach to the repair strategies of Russian loanwords in Nganasan<sup>1</sup>

Marianne Bakró-Nagy

Hungarian Research Centre for Linguistics, University of Szeged

## 1. Introduction

This paper aims to present a typological outline of loanword adaptation strategies of Russian loanwords in Nganasan, particularly word-initial complex consonant-cluster onsets. Key research questions addressed are as follows: what repair strategies are the most typical in Nganasan? What governs the selection of repair strategies to adapt structures? What is the background of competing or multiple solutions? The paper attempts to propose aspects for further approaches to the topic rather than formulate definite answers. The interdependence between the repair strategies of Nganasan and the phonetic properties of the onsets will be examined to prove that the perceptual properties of the clusters determine the strategy primarily. Sociolinguistic considerations will be included in the case of multiple adapted forms of the same borrowed words.

The antecedents of this typological approach on highly endangered Uralic languages are the analyses of Zsuzsa Várnai and Bakró-Nagy. The description of repair strategies of consonant clusters of Russian loanwords in Nganasan was initiated by Várnai (2012) when in a large-scale comparative study, she offered a detailed overview of consonant clusters in four Samoyedic languages, including Nganasan. She gave an account of syllable types of the languages, also introducing the adaptation processes of Russian word-initial onset clusters. In doing so, she also referred to typological generalizations. A systematic description of repair strategies of Russian word-initial consonant clusters in Mansi and discussing them in a broader typological context was presented by Bakró-Nagy (2018). The substantial difference between the two approaches is in explaining repair processes. While Várnai clarified adaptation processes as an alignment of Russian syllable structures to Nganasan rules, Bakró-Nagy attempted to prove that essentially not phonotactic forces but perceptual properties of the clusters drive the strategies. The same argumentation will be introduced this time also.

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<sup>1</sup> Without the competent, helpful and patient advice of Beáta Wagner-Nagy this paper would suffer from far more misinterpretation. Only I am responsible for the mistakes in this paper.

This paper is organized in the following way. After the basic information on Nganasan phonological and phonotactic properties (1.1), the repair strategies will be presented and explained in section 2. Section 3 presents the typology of repair strategies in Nganasan, followed by an explanation of what governs the selection of repair processes. Section 5 summarizes the conclusions shortly. The purpose of this overview could not be the compilation of an exhaustive corpus of Russian loanwords of Nganasan; the source of data is the annotated database of Nganasan Spoken Language Corpus 0.2 (NSLC 0.2) (<https://corpora.uni-hamburg.de/hzsk/de/islandora/object/spoken-corpus:nslc-0.2>).

### 1.1. Segmental inventories and syllable structure<sup>2</sup>

The vowel system of Nganasan is represented in Table 1. Vowels are short or long, and there are two diphthongs as well, the *îâ* and *ûû*.

Table 1. Vowel system of Nganasan

	front		central	back	
	unrounded	rounded	unrounded	unrounded	rounded
close	i	y	i		u
mid	e		ə		o
open				ɑ	

There are nineteen phonemes in the consonant system of Nganasan; *c* is an allophone of the affricate *tʃ*. *ʔ*, *j*, and *r* cannot appear word-initially. Word-finally, however, only *ʔ*, *m*, *ŋ*, *r*, and *j* can appear. Onset consonant clusters are not permitted word-initially. Mono-syllabic words and words beginning with a vowel are scarce, and if so, *i*, *u*, *ə*, and *ɑ* occur in the word-initial position. Syllables can be CVCV, CVCCV, or CV<sup>c</sup>CVC (<sup>c</sup> indicating empty slot).

For Nganasan–Russian language contacts see Helimski 1994.

## 2. Repair strategies

In Nganasan, both word-initial and internal clusters are simplified in adaptation. Word-initial onset clusters functioning as complex onsets are simplified by epenthesis, deletion and metathesis, though with different frequencies. Since this overview concentrates on the types of strategies, tokens will be mentioned only when essential for the explanation.

<sup>2</sup> For further information see Wagner-Nagy 2022, from which the above data are also derived.

Table 2. Consonant system of Nganasan

	bilabial	dental	alveolar	pal./pal.-alv.	palatalized	velar	glottal
voicel. plosives			t	[c]		k	ʔ
voiced plosives	b			ʃ		g	
nasals	m		n	ɲ		ŋ	
trill			r				
fricatives		ð	s		sʲ		h
affricate				tʃ			
approximant				j			
lat. appr.			l		lʲ		

2.1. Epenthetic processes

Two types of epenthetic processes are observable. Consonant clusters are simplified either by a prothetic vowel inserted in front of the consonant cluster (1) or by an anaptyctic vowel between the cluster's two constituents (2). As a result, an additional syllable is displayed actually, and in both cases, the constituent of the original cluster is restructured into separate syllables:

- (1) #CCV\_ → #vC\$CV\_
- (2) #CCV\_ → #Cv\$CV\_

The position of the epenthetic vowel is governed by the quality of the first constituent of the cluster. If it is an obstruent other than s and independently of the second constituent, an anaptyctic vowel is epentheticised (cf. 4), but if it is a sibilant, a prothetic vowel is inserted (cf. 5). The quality of the epenthetic vowel, in turn, is determined by its initial (prothetic) or intervened (anaptyctic) position. Hence the generalization characterizing the relationship of the position and quality of the segments acting in the adaptations is as follows (3):

- (3) quality of intial consonant → position (of epenthetic vowel) → quality (of epenthetic vowel)

In an anaptyctic position, the quality of the inserted vowel matches the vowel on the right of the epenthetic site (being originally the nucleus of the first syllable or, in one-syllabic words, the only vowel of the sequence). It is not the aim here to discuss the adaptation of

vowels, but it is apparent from the examples that their behaviour is less varied, namely, they are copied faithfully in Ngasasan. Therefore the essential determinant factor in anaptyxis is to match the quality of the copied vowel on the right, arousing the impression of harmonic stems in most cases (if word-final schwas are considered neutral). If this vowel is front, the anaptyctic vowel is also a front segment, usually [i] (4a). In the case of ‘chieftain’, in the Russian word, the vowel is back; the inserted vowel is [i] and not a back segment. The only possible explanation would be the palatal environment, which, however, is not sufficient proof in itself.

(4)	TRV	→	TvRV <sup>3</sup>	
(4a)	Russian		Ngasasan	
	brʲɪgəd		birigadə	‘team’
	knʲɪgə		kɪnɪgə	‘book’
	knʲasʲ		kɪnəsə	‘chieftain’
	krʲest		kiristə	‘cross’

But when the vowel on the right of the epenthetic site, is back, the inserted vowel will mostly match the backness of it (4b).

(4b)	Russian		Ngasasan	
	pʌn		pəlanə	‘plan’
			holanə	
	brʲukʲɪ		burukəʔ	‘trousers’
	trɔbɑ		turubɑ	‘chimney’
	kʌdɔfkə		kaladovkɑ	‘chamber’
	kʌs		kalasə	‘class’
	kʲɪʊʧ̣		kulʲutʃ	‘key’
	krupa		kyryhə	‘cereals’

There are cases when, as in pəlanə/holanə ‘plan’, the inserted vowel does not faithfully copy the second syllable’s segment; nevertheless, their backness is retained. The example of kyryhə is somehow different since a back closed rounded vowel would be expected; this question should be answered by the vowel adaptation process of Ngasasan.

However, this transparent process does not occur when the first constituent of the cluster is sibilant. The words in (5) illustrate the adaptation of such forms: a prothetic vowel introduces the sequence, primarily an [i], independently of the vowel in the following syllable (5). What the forms for ‘table’ concerns may also be the case that they are not direct

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<sup>3</sup> S, T, H and R stand for sibilants, plosives, fricatives, sonorant consonants, V for a lexical, v for an inserted vowel respectively.

loans from Russian but were borrowed through Dolgan. In that case, however, a round back vowel would be the expected prothetic segment, and not a front unrounded.<sup>4</sup>

(5)	STV	→	vSTV	
	Russian		Nganasan	
	stol		əsto:lə	‘table’
			istolə	
	stul		istuələ	‘chair’

The low number of the prothetic examples is attributable to the phonotactic property of the word-initial syllables. Words in Nganasan only extremely rarely begin with a vowel, being either conceptual words or pronouns. For this reason, the scarcity of protasis is not an adaptational specificity of the language but the consequence of independent rules. It should be noted as well that in earlier descriptions, though not frequently, sibilant-initial loanwords with other than prothetic [i] or [ə] were mentioned<sup>5</sup>, turning out not to be Nganasan.

There are examples, though very rarely, when two repairing strategies are cooperating, i.e. deletion (10) and anaptyxis (6). In the word for ‘certificate’, though it begins with a sibilant-initial cluster, instead of the emergence of a prothetic [i], the sibilant is deleted: (STRV → TRV) as in most of the cases of *s*-initial clusters. Consequently, the resulting TRV cluster behaves like the two-constituent plosive-initial clusters (3b). Since the Russian plosive *p* is represented by *h* in Nganasan (in line with the general *p* > *h* change), the HRV context of anaptyxis is secondary (see also *holanə* ‘plan’ in 3b).

(6)	STRV	→	HvRV	
	Russian		Nganasan	
	sprafkə		horaapka	‘certificate’

Our data also contain examples that require further explanations concerning the vowel's quality or its position (7a–b). The word (6a) *śiram* ‘scar’ is sibilant-initial, i.e. either an anaptyctic vowel would be expected (see 5 above) or the deletion of it (cf. 10). Nevertheless, the metadata on the informant reveals that he is Enets–Nganasan bilingual (oral communication – Beáta Wagner-Nagy), a presumable reason for the different patterning.

In (7b), the fricative [f] is the first constituent of the consonant cluster followed by a trill, and since on the right of the epenthetic site the vowel is back labial, a back labial anaptyctic segment would be expected instead of [i] (cf. 3b).

<sup>4</sup> I thank Valentin Gusev for this and all his other comments.

<sup>5</sup> For example, the loanword ‘school’ with a prothetic [a] is referred to by Várnai (2012: 19): Russian *školə* > Nganasan *askolə*. The word, however, is Dolgan (and recorded from a Dolgan speaking informant).

- |      |           |                     |          |
|------|-----------|---------------------|----------|
| (7a) | Russian   | Nganasan            |          |
|      | gram      | s <sup>h</sup> iram | ‘scar’   |
| (7b) | Russian   | Nganasan            |          |
|      | franʃsʲjə | fīranci             | ‘France’ |

## 2.2 Deletion

Deletion is an asymmetric strategy in Nganasan because it applies mainly to sibilant+stop clusters deleting the first constituent (C1C2 → C2). As a result, any stop of the system can become word-initial. If it is [p], the *p > h* change applies in the same way as in the epenthesis above (4b: holanə, kyryhə, 6: horaapka).

- |     |                        |                       |              |
|-----|------------------------|-----------------------|--------------|
| (8) | STV →                  | TV                    |              |
|     | Russian                | Nganasan              |              |
|     | spəs <sup>h</sup> ibə  | hūas <sup>h</sup> ibə | ‘thanks’     |
|     | sp <sup>h</sup> irt    | hiirtə                | ‘alcohol’    |
|     | stəkan                 | takanə                | ‘cup’        |
|     | skəm <sup>h</sup> ejkə | kamejka               | ‘bench’      |
|     | skaskə                 | kaska                 | ‘tale’       |
|     | skəvərəda              | kəburuda              | ‘frying pan’ |
|     | školə                  | kolə                  | ‘school’     |
|     | zdorəvə                | dərəba                | ‘hello’      |

Triple consonant clusters are repaired in the same way as the double ones. This is the case in (6) combined with epenthesis (spr → hVr), and similarly in (9) below, where both the fricative and the sibilant constituent is deleted.

- |     |                      |          |        |
|-----|----------------------|----------|--------|
| (9) | HSTV →               | TV       |        |
|     | Russian              | Nganasan |        |
|     | fstəpat <sup>h</sup> | tufai    | ‘join’ |

Examples in (8) and (9) represent the overall C1C2 → C2 strategy in Nganasan in a double sense, i.e. the first constituent is deleted, which is a sibilant. Deletion of the second, non-sibilant constituent (C1C2 → C1) of the cluster is far more exceptional. In (10), a trill is deleted; the origin of the word is disputable, and if it is not of North Samoyedic origin, it must be an ancient borrowing (personal communication – Valentin Gusev). The scarcity of such examples confirms the general validity of sibilant-deletion in Nganasan.

- |      |         |          |                 |
|------|---------|----------|-----------------|
| (10) | TRV →   | TV       |                 |
|      | Russian | Nganasan |                 |
|      | кроме   | komə     | ‘except, apart’ |

### 2.3 Metathesis

Discussion of metathesis as an adaptation strategy in typological descriptions is far less frequent than processes discussed above. It is discussed by Várnai (2012: 138) also as a rare repair strategy in Samoyedic, mentioning it from Enets and Selkup only. It is, however, one of the most crucial strategies in Mansi (Bakró-Nagy 2018). Its role seems to be less representative in Nganasan, but in line with the general observations on CV metathesis and the languages mentioned above, it displays the release of stop+trill clusters.

- (11) TRV → TVR  
 Russian Nganasan  
 brʲiqədʲir birgədirə 'brigade leader'

### 2.4 Multiple strategies

Even comparing this narrower range of examples, it is recognized that multiple strategies may apply to identical forms (12a), or identical initial clusters (12b).

- (12a)br: birigadə 'team' (4b) birgədirə 'brigade leader' (12)  
 (12b)kr: kiristə, kyryhə 'cross' (4a) komə 'except, apart' (10)

The multiplicity of the strategies can still be supplemented with words of repaired and copied forms (13).

- (13) kɲ: kɲigə (4a) kɲigə  
 pɭ: pəlanə/holanə (4b) plənə  
 kl: kalasə (4b) klasə  
 kɭʲ: kulʲutʃ (4b) kɭʲutʃ  
 st: əsto:lə, istolə (5) stolʲi  
 sk: kaska (8) skaskə  
 ʃk: kolə (8) ʃkolə

The multiplicity of competing repair patterns labelled as the *too-many-solutions* problem (Steriade 2001) or *differential faithfulness* (Broselow 2009) is widespread in the world's languages, requiring compound explanations (see section 4 below). Before that, however, an overview of the typology of Nganasan repair strategies will be attempted.

## 3. Typology of repair strategies in Nganasan

As it was told, this overview is not based on an exhaustive corpus of Russian loanwords in Nganasan, but even in the absence of a complete dataset, the emerging tendencies are well identifiable (14; non-typical examples in brackets).

- (14a) anaptyxis TRV → TvRV  
 (14b) deletion STV → TV  
 (14c) protasis STV → vSTV  
 (14d) (methatesis TRV → TVR)  
 (14e) (deletion TRV → TV)

It thus appears that the two prevalent processes are anaptyxis and deletion, playing a significant role over protasis and metathesis. Concerning the position of epenthetic vowels, anaptyctic vowels occur in TRV, prothetic vowels (though much rarely) in STV position. According to Broselow (2015) typology, there are consistent and non-consistent languages concerning the position of vowels. In consistent languages, anaptyctic or prothetic vowels occur either in TRV or in STV position, in non-consistent languages in TvRV and vSTV position, respectively. In the modified typological distribution of Broselow (Bakró-Nagy 2018), presenting Mansi language as well, Nganasan should be classified as a “mixed Type 1” language (Table 3).

Table 3. Position for inserted vowels

position	anaptyxis	protasis	mixed position, type1		mixed position, type2 vTRV, SvTV
			TvRV, vSTV	TvRV, vSTV, vSRV	
Japanese	✓				
Iraqi Ar.		✓			
Cairene Ar.			✓		
Mansi				✓	
Nganasan			✓		
Unattested					

In this type, the correlation between the position and the quality of the epenthetic vowel is as the following: either a default vowel or a copy vowel occurs in every position or default vowel before the cluster and a copy vowel within the cluster<sup>6</sup>. In 2.1 (4), it was demonstrated that in TvRV position, the copied/adapted vowel determined the quality of the inserted vowel, while in vSTV position, a default [i]/[ə] appeared. Accordingly, Nganasan represents the “mixed Type 1” again (Table 4).

<sup>6</sup> A stands for a lexical vowel, a for a copy vowel, i for a default vowel (Broselow 2015: 309).



Table 4. Interaction between position and quality of the vowel

	default	mixed quality, type1		copy quality	mixed quality type2
	quality	TaRA, iSTA	TvRV, iSTV, iSRV	TaRA, aSTA	TiRA, aSTA
Cairene	✓				
Mansi			✓		
Nganasan		✓			
Unattested?					

Turning to deletion and metathesis and combining them with the epenthetic ranking, the following processes are responsible for avoiding initial clusters (Table 5). If C1 is an obstruent (other than s), C2 a sonorant, anaptyxis, will apply or rarely deletion or metathesis. If C1 is a sibilant and C2 an obstruent deletion will apply, more rarely protasis, i.e. it seems that the sibilant nature of the C1 blocks both anaptyxis or metathesis.

Table 5. Cluster types and repair processes in Nganasan

	anaptyxis	deletion	protasis	metathesis
TRV	TvRV	TV		TVR
STV		TV	vSTV	

Note that observations on Nenets, Enets and Selkup (Várnai 2012) and Mansi (Bakró-Nagy 2018) repair strategies could be compared with the above generalisations demonstrating that very similar processes are valid in all these languages as well.

#### 4. What governs the selection of repair strategies?

In loanword phonology, competing explanations are offered to clarify the nature of adaptations and repair strategies. Two basic approaches can be distinguished, one seeking the explanations in the phonetic, phonological structure of the language (grammar-internal factors), and the other finding motivations also in the socio- and psycholinguistic background. What the intra-linguistic approaches concern, the phonology approach argues that adaptation is independent of phonetic realizations; they follow the principles of category (segment) and structure (phonotactics) preservation; moreover the access to the donor language phonology is based on the bilingual competencies of the speakers (e.g. Hyman 1970, Uffmann 2007, Paradis and LaCharité 2005). In contrast, the phonetic ap-

proach (e.g. Peperkamp and Dupoux 2003, Peperkamp 2005) emphasizes the role of perception in adaptation, when non-native sounds or structures are mapped to the native-language categories and structures purely based on acoustic similarities, attributing only a secondary role to the phonology. In the third, phonology-perception approach, the initial phase is how the acoustic properties of the donor language are perceived, followed by a language-based phonological adaptation (e.g. Steriade 2001, Yip 2006, Kenstowicz 2003, 2004, Kenstowicz and Suchato 2006).

The other, grammar-external approach seeks the explanation in sociolinguistic and situation-specific sociolinguistic factors. While sociolinguistic parameters as age, gender, social class, language dominance, level of bilingualism and others are (or would be) indispensable in the mapping of loanword production, these parameters are frequently ignored in the descriptions. Even less attention is paid to situation-specific factors as topics in speech, speakers' association with the donor language and culture, words' association with the source language and its culture (Hashimoto 2019).

The purpose of this short overview cannot be the discussion of the above-introduced loanwords from grammar-external aspects, though the meta-data of the Nganasan database offers a good number of illuminating information on the informants. They will have relied only on cases when helpful for the grammar-internal analysis.

The overview above, summed up in Table 5, shows that in Nganasan, two competing strategies are prevalent, epenthesis and deletion, while metathesis is less significant. It was also represented that there is a straightforward but not exclusive distribution between epenthesis and deletion depending on the cluster-type: epenthesis is more characteristic to obstruent (other than s)+sonorant, deletion to sibilant+sonorant clusters. The combination of these two strategies is well known, for example, from the Polynesian languages (Kang 2011), and there are languages as well which combine the two strategies for SC clusters, as Maori (Herd 2005), in the same way as in the word for 'certificate' (6) in Nganasan. Surveys on the word-initial onset clusters show that epenthesis is the dominant strategy, and there are languages where this is the only solution, though Finnish, on the contrary, belongs to the deletion-dominant languages.

What SC clusters concerns it was demonstrated that two strategies are related to them (examples in (5–6, 8) not considering the debatable example in (7a)): protasis and deletion, and it seems that there is an asymmetry between them. Considering the perceptual properties of sibilants, it is evident that they belong to strident fricatives with robust internal cues both for manner and place. This means that their perceptibility is optimal in all contexts in general, followed either by stops or nasals, liquids. This being the case, i.e. if sibilants are easily perceptible, the question is why are they deleted in initial SC clusters. A tentative explanation performed here relies on sonority markedness in SC clusters. According to the Minimal Sonority Distance (Clements 1990, Carlisle 2006), a maximal sonority rise is demanded between the members of the syllable, including the constituents

of complex syllable onsets: in well-formed syllables, the second constituent (C2) of the cluster should be more sonorous than the previous (C1) one (Clements 1990: 303). In this way, the C2 constituent will be closer in sonority to the peak of the syllable. In an *sn* or *sl*, *sr* clusters, this demand is fulfilled since they are less marked concerning the sonority distance between them. In Nganasan, however, we have more marked *sp*, *st*, *sk* clusters with a reverse sonority-sequencing, where C1 is more sonorous than the stop of the C2 constituent. L1 acquisition observations revealed nevertheless that less sonorous onsets are preferred over more sonorous tones. In the case of SC clusters, the most common strategy is to delete the more sonorous segment (see the overview of Cardoso 2008: 20): /*st*/op → [t]op, /*sl*/eep → [s]eep, and see also Nganasan (8) /*st*/ɛkan → [t]akanə ‘cup’ above. (In this sense, L1 acquisition and repair strategy proceed on parallel paths.) It should be noted that the deletion of the C2 stop constituent from the cluster seems to be unusual, though (11) /*st*/ɔlɔtu → [s]olɔtu ‘glass’ shows an example precisely for this type. Though these observations need further researches, they can be helpful in the explanation of sibilant deletion.

Turning to epenthesis in SC clusters (5), the question remains why sibilant initial onsets are repaired by protasis but obstruent (other than s)+sonorant clusters not. Following the (often debated, e.g. Goad 2012) explanation of Fleischhacker (2001, 2005), who suggests that vowel epenthesis site is where the sonority and the auditory difference between the neighbouring and inserted segments are low. Hence in vSC (V+S+sonorant) sequences, the auditory similarity between the epenthetic vowel and the sibilant is higher than in SvC (S+V+sonorant) sequences (Kang 2003: 221; for this explanation, see also Várnai 2012): (5) /*st*/ol → [ɪst]olə ‘table’. This way of epenthesis follows from the Minimal Saliency Principle (Kenstowicz 2003, 2007, Kenstowicz and Suchato 2006) in the sense that the inserted vowel should be close to the consonantal context, short in duration, and usually not high, i.e. schwa, [i] or [u], just like schwa and [i] in Nganasan. The Minimal Saliency Principle is also responsible for the obstruent+resonant (in Nganasan nasal and liquid) anaptyxis, where the vowel is inserted in front of the highly sonorant C2 constituents, e.g. (4a) *kn*ʲigə → *kɪ*ʲigə ‘book’, (4b) *tɾ*ɔba → *tɪ*ɾɔba ‘chimney’. (For a very similar background process in consonant–vowel metathesis, see Bakró-Nagy 2018).

When analysing the protasis versus deletion repairs of *sp*, *st*, *sk* clusters above, auditory representations’ ambiguities were discussed as a possible explanation for the *too-many-solution* problems. The involvement of grammar-external data offers further possibilities for a better understanding of the source of this phenomenon, to be illustrated here by three examples of competing forms with *st*, *sk* and *pl*<sup>7</sup>. *i*. In (13), the following forms were denoted for ‘table’ as a word with epenthesis and copy, originating from three different informants: əstolə (TNS) ~ istolə (MVL) ~ stolʲi (JDH). *ii*. Forms for ‘tale’ with epen-

<sup>7</sup> Informants are referred with their initials.

thesis and copy are originating from the same informant, MVL: *kaskarə* ~ *skaskərə*. It is apparent that this informant uses ST-clusters variably, since in ‘table’ an epenthetic vowel appears, in ‘tale’ the sibilant is either deleted or copied, and in (*stəɫba* →) *stəɫbaa* ‘pole’ the sibilant is copied again. The examples could be easily multiplied. *iii*. At least three forms are meaning ‘plan’: *holanə* (KTD) ~ *pəlanə* (TKF) ~ *planə* (KTD, TKF). The copied forms are used by both informants, even by KTD, who uses the *h*-initial, obviously older form than the *p*-initial one.

Finally, about the significance of word-frequency in reducing the *too-many-solution* phenomenon: it is well exemplifiable with the word (8) *hūāsʰibə* ‘thanks’ used invariably in the same form according to the data available so far.

## 5. Summary and Conclusion

This paper attempted to give some of the results from a typological description of Nganasan loanword phonology with special respect to repair strategies of word-initial onset consonant clusters. First, a systematic analysis of input consonant clusters and their repaired forms was presented to detect the interdependence of the quality of the consonants and deletion vs epenthesis (protasis and anaptyxis). It was shown that a clear-cut distinction is made in the repair strategies of clusters with and without sibilants, determining the site of the epenthetic vowels as well. The typological comparison revealed the following correlation between epenthesis and deletion: sibilant+CV > vSCV ~ S-deletion, obstruent+CV > CvCV (~ C2 deletion) (cf. also Table 5). It was revealed as well that within the types of epenthesis and the quality of the vowels, Nganasan belongs to the so-called mixed type languages (cf. Table 3–4).

It was proposed that deletion and the distribution of epenthetic sites are attributable to acoustic properties of the segments, obeying the Minimal Saliency Principle. In conclusion, it was noted that with particular respect to the *too-many-solution* problem, extragrammatical aspects should be involved in the analysis.

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