

Base-Identity and the Noun-Verb Asymmetry in Nivkh

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1. Introduction

1.1. Background

Morphologically complex words often exhibit phonological similarities with their morphologically related base forms which they are derived from. In a number of cases, these similarities yield a marked phonological pattern given the general rules or phonotactics of the language (Kenstowicz 1996, Burzio 1997, 2002 etc.). In Optimality-Theory (OT), similarity between existing words is captured by Output-to-Output (OO) correspondence constraints (Burzio 1996, 2001, Kenstowicz 1996, 1997, Benua 1997, Ito and Mester 1997, Steriade 1997 etc.). The marked phonological pattern arises when similarity between words takes priority over the canonical phonology of the language. OT expresses this situation by ranking OO-correspondence constraints above phonological markedness constraints. OO-correspondence constraints evaluate the output candidates and select the one which is most similar to the base.

Since the base plays a crucial role in computing the phonology of its derivatives, it is important to identify the correct surface form as the base. Many authors have observed that OO-constraints have access to the base only if the latter occurs as an independent word (Kenstowicz 1996, Benua 1997a, Ito and Mester 1997).¹ Consider the s-voicing observed in the northern dialects of Italian. In these dialects, *s* and *z* are in complementary distribution. *Z* appears intervocally, when the flanking vowels belong to the same phonological word (examples from Kenstowicz 1996: 373-374).

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- 1.1 a. a[z]ola 'button hole'
a[z]ilo 'nursery school'
ca[z]-a 'house'
ca[z]-ina 'house - diminutive'
b. lo [s]apevo 'I knew it'
telefonati [s]i 'having called each other'

The distribution of s-voicing in lexical items containing a prefix is more complicated. When the target precedes the boundary, s-voicing applies (1.2a). But when the target follows the boundary, s-voicing may or may not apply, even if the structural description of s-voicing is met (1.2b,c).

- 1.2 a. di[z]-onesto 'dishonest'
di[z]-ugale 'unequal'
b. re-[z]istenza 'resistance'
pre-[z]entire 'to have a presentiment'
c. a-[s]ociale 'asocial'
bi-[s]essuale 'bisexual'
pre-[s]entire 'to hear in advance'

The unexpected blocking of s-voicing in 1.2c is in sharp contrast with the items in 1.2b where *z* surfaces intervocalically, following the phonological norm of the language. Nespor and Vogel (1986) pointed out that the crucial difference between the items in 1.2b and 1.2c lies in the lexical status of the stem to which the prefix is attached; in 1.2c the stem occurs as an independent word (*sociale*, *sessuale*, etc.) whereas in 1.2b it does not (**sistenza*, etc.). Following this view, Kenstowicz (1996) claimed that there is a lexico-morphological pressure from the independently occurring stem to surface its derivative as similar as possible. The presence of such an independently occurring immediate constituent is thus crucial in computing the phonology of a morphologically complex item. Kenstowicz dubbed this generalization *Base-Identity*; the base forces its derivative to be formally as similar as possible in order to “improve the transparency of morphological relationships between words and enhance lexical access” (Kenstowicz 1996: 372).

- 1.3 Base-Identity: Given an input structure [X Y] output candidates are evaluated for how well they match [X] and [Y] if the latter occur as independent words. (Kenstowicz 1996: 372)

The languages in East Asia provide an interesting test for this generalization. Languages as Korean or Japanese show a systematic difference in the composition of verbs and nouns; while verbal stems always surface with a morphological extension, nominal stems may surface without such an extension. This means that complex words formed from a nominal stem always have an independently occurring base to which they phonologically should conform, whereas verbal derivatives lack such a base and hence should not show such conformity. This prediction is borne out in Korean in which derivatives of nominal and verbal stems are subject to different phonology (Kenstowicz 1996. See section 2.3 below.). In this paper, I discuss another language of East Asia, Nivkh, which also has an asymmetric composition of nouns and verbs like Korean and Japanese. I will focus on two phonological phenomena, Consonant Alternation and Final Fricative Devoicing and show that both phenomena exhibit asymmetries between nominal and verbal phonology. I will discuss each case in detail and argue that Base-Identity is the driving force of these asymmetries.

The article is organized as follows. I will start with a descriptive sketch of Consonant Alternation (section 2.1) and then illustrate the exceptional behavior of nominal stems as a case of noun-verb asymmetry (section 2.2). While most previous works, including my own, somehow stipulated the asymmetric behavior of nominal and verbal stems, I will argue that Base-Identity provides a superior analysis which is free from such a stipulation. Section 3 discusses the second phenomenon, Final Fricative Devoicing. I will illustrate the asymmetric behavior of fricative-final nominal and verbal stems when followed by a suffix. The pattern of asymmetry is as in CA: while verbal phonology is subject to canonical phonology, nominal phonology is not. Section 4 concludes.

1.2. About Nivkh

Nivkh (also called Gilyak) is an isolated language spoken by the people of Nivkh, who live on the island of Sakhalin and in the lower reaches of the Amur River in the Russian Far East. The language has four dialects and the major discrepancy is between the Amur dialect, spoken in the Amur area on the continent and the west coast of north Sakhalin, and the Sakhalin dialect

spoken in the east coast of Sakhalin. Nivkh is listed in the UNESCO Red Book on endangered languages as being seriously endangered. According to the census of 1989, the percentage of speakers is 23, 3% of the total population of 4,681 (see www.let.rug.nl/~toshi/ for more information). This article concerns the phonology of the Amur dialect spoken by the continental Nivkh. All the examples are from the following sources, unless otherwise mentioned: Krejnovich (1937), Saveleva and Taksami (1970).

2. Consonant Alternation

2.1. A descriptive sketch

I will first outline the segmental inventory of Nivkh.

2.1 Consonantal inventory of Nivkh

(I)	aspirated plosives	p ^h	t ^h	c ^h	k ^h	q ^h
(II)	non-aspirated plosives	p	t	c	k	q
(III)	voiceless fricatives	f	ʃ	s	x	χ
(IV)	voiced fricatives	v	r ²	z	ɣ	ʁ
	nasals	m	n	ɲ	ŋ	
	lateral		l			
	glides		j			h

2.2 Vowels

i	ə	u
e	o	
a		

Consonant Alternation (henceforth CA) is a phonological process which changes the feature [continuant] in obstruents when they are placed in certain phonological and morphosyntactic contexts. Descriptively, CA consists of two processes: spirantization, in which a plosive changes to a fricative, and hardening, in which a fricative changes to a plosive. Laryngeal features are also relevant since aspirated plosives only alternate with voiceless fricatives and non-aspirated plosives with voiced fricatives, i.e. the alternation is strictly between the obstruents of row (I) and (III), or (II) and (IV).^{3, 4}

Spirantization: (I) > (III), (II) > (IV)

- 2.3 a. (I) > (III) macŋa [r̥]om (< t^hom) ‘fat of a seal’
 seal fat
 c^holŋi [χ]os (< q^hos) ‘neck of a reindeer’
 reindeer neck
 b. (II) > (IV) p^heq [v]əŋx (< pəŋx) ‘chicken soup’
 chicken soup
 macŋa [z]us (< cus) ‘meat of a seal’
 seal meat

Hardening: (III) > (I), (IV) > (II)

- 2.4 a. (III) > (I) c^hxəf [q^h]a- (< χa-) ‘to shoot a bear’
 bear shoot
 cus [t^h]a- (< řa-) ‘to bake meat’
 meat bake
 b. (IV) > (II) tux [k]e- (< ʏe-) ‘to take an axe’
 axe take
 p^hnənx [t]əu-(< rəu-) ‘to teach one’s sister’
 one’s sister teach

The phonological contexts of spirantization and hardening are in complementary distribution. Spirantization takes place when the target (plosive) follows a vowel, a glide, or a plosive (2.5). There is no spirantization when the target follows a fricative or a nasal (2.6).

Spirantization Preceding segment

- 2.5 Vowel macŋa [r̥]om ‘fat of a seal’
 Glide k^hənraj [r̥]om ‘fat of a duck’
 k^hənraj [v]əŋx ‘duck soup’
 Plosive ət [r̥]om ‘fat of a species of duck’
 amsp [v]əŋx ‘soup of a species of seal’

No spirantization

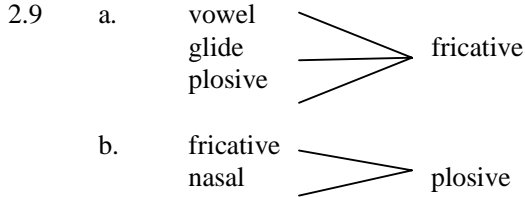
- 2.6 Fricative c^hxəf t^hom ‘bear fat’
 c^hxəf pəŋx ‘bear soup’
 Nasal k^hej t^hi ‘sun ray’
 rum dəf ‘Rum(person)’s house’

On the other hand, hardening occurs when the target (fricative) follows either a fricative or a nasal (2.7). When a segment other than fricative precedes the target, hardening does not occur (2.8).

Hardening	Preceding segment		
2.7	Fricative	cxəf [q ^h]a- (<χa-)	‘to shoot a bear’
		lovř [c]osq- (<zosq-)	‘to break a spoon’
	Nasal	qan [d]əu- ⁵ (<rəu-)	‘to teach a dog’
No hardening 2.8	Vowel	ŋə χa-	‘to shoot an otter’
		ma řa-	‘to bake dried fish’
	Plosive	ət χa-	‘to shoot a species of duck’
	Glide	kəj seu-	‘to dry a sail’

Although phonological conditions of these alternations seem to be complex, it turns out to be less so once we focus on the output strings they create. Namely, the accomplished segmental sequence is always vowel-fricative, glide-fricative, plosive-fricative on the one hand and fricative-plosive, sonorant-plosive on the other. In sum, spirantization and hardening conspire to achieve the segmental sequences illustrated below.

Structural goals of spirantization and hardening



Whether this sequence is accomplished by spirantization or hardening is a matter of input. Spirantization activates when a plosive is in the input, whereas hardening activates when a fricative is in the input. In the past, many approaches have overlooked this generalization and described the rules as if they had independent structural goals. This is not the case.

Let us now move to the morphosyntactic conditioning. CA targets a segment at the left edge of a *derived* morphosyntactic unit in the presence of a preceding segment. CA applies cyclically to every left edge of a morpho-syntactic unit until the maximal projection (NP, VP) is reached.

Means of derivation			
2.10	Prefixation	p ^h -[ř]u (< t ^h u) REF-sledge	‘one’s own sledge’
	Postposition	t ^h əx-tox top-ALL tu-rox qan-dox	‘towards the top’ ‘towards a lake’ ‘towards a dog’
	Reduplication	tək[ř]ək-	‘to be silent’
(Sakhalin dialect, Hattori 1962: 107)			
	NP formation:	macŋa [ř]om	‘fat of a seal’
	VP formation:	cəf [q ^h]a- (< χa-)	‘to shoot a bear’

On the other hand, CA never targets segments in a non-derived environment, nor does it apply across XP boundary, as shown in 2.11 and 2.12, respectively.

CA does not apply in non-derived environment

2.11	utku	*ut[ɣ]u	‘man’
	nəɣs	*nəɣ[c ^h]	‘teeth’

No CA across XP boundary (subject-predicate)

2.12	eyɫŋ řo-	‘The child holds (something)’
	= [NPeyɫŋ] [VPřo-]	(‘child’ is subject)

Example 2.13 below differs minimally from example 2.12 above w.r.t. the application of CA. In the former, CA applies since the noun is the object of the following predicate. Thus these two words form a VP, differing minimally from example 2.12.

2.13	eyɫŋ [t ^h]o-	‘(Someone) holds the child’
	= [VP[NPeɣɫŋ][v t ^h o-]]	(‘child’ is object)

2.2. The spirantization – hardening asymmetry

There is one environment in which the regular pattern of CA as depicted above fails to apply. Nouns beginning with a fricative never undergo hardening. In such a case, the structural goal of CA (2.9) is not achieved. In this context the otherwise illicit fricative-fricative or nasal-fricative sequence appears.

2.14	a.	t ^h ulv vo winter village	*t ^h ulv [b]o	‘winter village’
	b.	c ^h ɲər vox grass hill	*c ^h ɲər [b]ox	‘a hill covered with grass’
	c.	təf ɣə house door	*təf [t ^h]ə	‘entrance door’
	d.	t ^h eɲ vaqi coal box	*t ^h eɲ [b]aqi	‘coal box’

Previous works have either described this context as an exception to CA, or did not discuss it. In most cases, these works simply stipulated that a) nouns do not undergo hardening, or alternatively b) only transitive verbs undergo hardening. Once stated as a condition this way, the application of hardening to nouns can indeed be avoided. However, adding such a condition (in either form) to a phonological rule pairs prosodic phonology with specific category labels (transitive verb, noun), which is unlikely to occur in natural languages (Nespor and Vogel 1986, Selkirk 1986 etc.).⁶ But most critically, it is explanatorily unsatisfying: why should hardening be restricted to transitive verbs (or alternatively, why should nouns be an exception to hardening)? No literature provides satisfactory answer to this question.

The tacit assumption prevailing in the previous works is that the input to CA is the citation form, i.e. the form that appears in isolation. Following this assumption, the transitive verbs ought to undergo hardening since they initiate with a fricative in the citation form. However, there is no a priori reason that the citation form should be the underlying form. In Shiraishi (2000), I defended the position that the citation form of these transitive verbs cannot be the underlying form, if we want to advocate a phonologically plausible analysis for the observed spirantization-hardening asymmetry. The lack of hardening in nouns could be interpreted as evidence that CA consists solely of spirantization, without hardening. I

argued that transitive verbs of Nivkh initiate with a plosive at the underlying level, instead of a fricative that appears in the citation form. Initiating with a plosive, transitive verbs now undergo spirantization in the same way as nouns do.^{7, 8}

2.15

	Previous analyses		Shiraishi (2000)	
	VP 'shoot a bear'	NP 'bird soup'	VP 'shoot a bear'	NP 'bird soup'
Underlying form	cxəf χa-	p ^h eq pəjɪx	cxəf q ^h a-	p ^h eq pəjɪx
Spirantization	not applicable	p ^h eq [v]əjɪx	blocked	p ^h eq [v]əjɪx
Hardening	cxəf [q ^h]a-	not applicable		
Surface form	cxəf q ^h a-	p ^h eq vəjɪx	cxəf q ^h a-	p ^h eq vəjɪx

The analysis in Shiraishi (2000) leaves hardening out of the list of phonological processes; nouns do not undergo hardening since there is no hardening in the phonology of the language.

2.16

	Previous analyses	Shiraishi (2000)
Underlying form	t ^h ulv vo	t ^h ulv vo
Spirantization	not applicable	not applicable
Hardening	t ^h ulv [b]o	
Surface form	● ^h t ^h ulv bo	t ^h ulv vo

●^h: incorrect output

This analysis is free from category-specific specification in the structural description of the rule, which was inevitable in the previous analyses.

Although this analysis explains nicely why fricative-initial nouns never undergo hardening in Nivkh, it is not without problems. First, it manipulates the underlying form of a specific lexical category (transitive verb) in order to explain phonologically exceptional behavior. Although such a 'prespecification' at the underlying level is not an uncommon way to approach phonological exceptions (cf. Inkelas, Orgun and Zoll 1997 amongst others), such an approach does not explain why only this particular class of words needs to undergo such manipulation. Since prespecification puts unpredictable information into the lexicon, it is a

strong descriptive device which leaves little space for phonological generalizations. Contrary to what seem to be the case at first glance, the analytical gain of Shiraishi (2000) from previous analyses is not so obvious. One may ask correctly what the difference between the two analyses is, which claim that a) nouns are exceptions to hardening (previous analyses) or b) transitive verbs undergo spirantization because they initiate with plosives underlyingly (Shiraishi 2000). In other words, it remains an arbitrary choice that only transitive verbs, and not other categories, undergo prespecification.

Secondly, the relationship between the underlying form and the citation form is obscured in transitive verbs. By positing a form other than the citation form as the underlying form, the citation form would always be derived from the underlying form by some morphological operation. That is, Shiraishi (2000) created asymmetry between the morpholexical make-up between nominal and verbal stems.

2.17

	Nominal stem	Verbal stem
Underlying form	pəɲx	q ^h a-
Surface form	pəɲx	χa-

In fact, this asymmetry describes the historical path of derivation of transitive verbs (Jakobson 1957, Austerlitz 1977). On synchronic grounds, however, it is highly doubtful whether such a morphological operation can be justified.

In the next section I propose an alternative approach to the spirantization-hardening (or noun-transitive verb) asymmetry, which makes use neither of prespecification nor of information about category label. Instead, I will argue that correspondence relation between output forms plays a decisive role in distinguishing the phonological behavior of the two groups. Once stated this way, nothing ought to be stipulated in order to derive the surface form; this follows naturally from the phonological principles of the language.

2.3. Noun-verb asymmetry as Base-Identity

In Nivkh, verbal and nominal stems differ from each other in one crucial morphological aspect; verbal stems should always end in a morphological extension but nominal stems do not. Or put differently, verbal stems never surface in isolation, whereas nominal stems do. This means that bare verbal stems cannot function as citation forms. Usually, the form with an infinitival suffix ($-d^i$, $-t^i$) provides the citation form.

2.18	Stem	/χa/	‘to shoot~’	/řo/	‘to take’
	Infinitive (citation form)	χa-d ⁱ		řo-d ⁱ	
	‘when~’	χa-ŋan		řo-ŋan	
2.19		/vo/	‘village’	/χota/	‘town’
	Citation form	vo		χota	
	Allative	vo-rox		χota-rox	

As mentioned in section 1, independent forms often exercise special influence on the realization of morphologically related forms in derived contexts. For instance, in certain varieties of English the existence of the form *condense* guarantees that the vowel of the second syllable in the morphologically related word *condensation* does not reduce to a schwa.

2.20	cònd[ɛ]nsátiɔn	còm[p]ənsátiɔn
	cond[ɛ̃]nse	cóm[p]ənsàte

Phonology would expect the unstressed vowel of *condensation* to surface with a schwa, as is the case with the structurally similar *compensation*. The usual explanation for this asymmetry is that the vowel reduction in *condensation* is blocked by virtue of the existence of the morphologically related form *condense*, which appears with a full vowel [ɛ] (Chomsky and Halle 1968: 110-116). On the other hand, *compensation* lacks such a morphologically related form with a full vowel. Hence unstressed vowel reduces to a schwa, following the phonological norm of the language.

Another example comes from Korean. In Korean a stem-final consonant cluster surfaces only when it is followed by a vowel-initial suffix. In combination with a consonant-initial suffix, the cluster is simplified to a single consonant (Kenstowicz 1996: 375).

2.21	Stem	/kaps/	‘price’	/talk/	‘chicken’
	Citation form	kap		tak	
	Nominative	kaps-i		talk-i	
	Comitative	kap-k'wa		tak-k'wa	

In the speech of younger generation of Seoul, however, simplification over-applies to contexts where vowel-initial suffix follows the stem.

2.22	Nominative	kap-i	tak-i
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Interestingly, this overgeneralization does not apply to verbal stems. Here the consonant cluster surfaces.

2.23	Stem	/əps/	‘not have’	/palk/	‘be bright’
	Past-informal	əps-əss-ə	(*əp-əss-ə)	palk-əss-ə	(*pak-əss-ə)
	Non-past-formal	əp-t'a		pak-t'a	

Kenstowicz analyzed the absence of the cluster simplification in verbal stems to be due to a lack of corresponding citation forms. As in Nivkh, verbal stems in Korean never appear in isolation; they should always appear with an inflectional ending. In contrast, nominal stems are free to appear without any inflectional ending, so they exercise strong influence on the realization of their derivatives. Verbal stems, on the other hand, surface with consonant clusters since there are no isolated counterparts which forces conformity to it. This is an instance of Base-Identity, which requires forms in derived contexts to be formally similar to the base. This is the generalization captured in the Base-Identity constraint of Kenstowicz (1.3), repeated below.

- 2.24 (=1.3) Base-Identity: Given an input structure [X Y] output candidates are evaluated for how well they match [X] and [Y] if the latter occur as independent words. (Kenstowicz 1996: 372)

We can account for the noun-verb asymmetry in Korean using Base-Identity as a high-ranked constraint. By ranking Base-Identity above a faithfulness constraint which prohibits deletion of a segment in the input (MAX), nominal stems surface with a single consonant in concordance with the base.

2.25

/kaps+i/ base: kap	Base-Identity	*CLUSTER	MAX
kapsi	*!		
☞kapi			*

Base-Identity is vacuously satisfied in verbal stems. Since there is no base to which verbal stems should conform, verbal stems exhibit canonical phonology. Consonant clusters surface only if a vowel-initial suffix follows, elsewhere they are simplified. A phonological markedness constraint *CLUSTER penalizes every output candidate containing a tri-consonantal cluster.

2.26

/əps+əss+ə/ base: ø	Base-Identity	*CLUSTER	MAX
☞əps-əss-ə			
əp-əss-ə			*!

2.27

/əps-t'a/ base: ø	Base-Identity	*CLUSTER	MAX
əps-t'a		*!	
☞əp-t'a			*

The noun-verb asymmetry of hardening in Nivkh is strikingly similar to the case of Korean. As in Korean, verbal stems of Nivkh are not allowed to surface in isolation; they always require a morpho-syntactic extension (2.18). This is in contrast to nominal stems, which may surface in isolation (2.19). The difference is reflected directly in their phonological behavior; verbal stems undergo hardening, nominal stems do not. In the next section I will show how this analysis formally works.

2.4. Base-Identity blocks hardening

I assume that the phonological markedness constraint that induces hardening to be the Obligatory Contour Principle (OCP) [fric].⁹ OCP [fric] prohibits adjacent fricatives. Base-Identity, as defined in the previous section, prefers output candidates which are similar to the base. With the

ranking Base-Identity >> OCP [fric], we obtain the desired output; hardening does not apply to nominal stems.

2.28

/tulv vo/ base: vo	Base-Identity	OCP [fric]	IDENT [cont]
☞ tulv vo		*	
tulv bo	*!		*

Base-Identity is satisfied vacuously in verbal stems since they lack a base. Being free from Base-Identity, an initial fricative now hardens to a plosive in order to circumvent an OCP violation.

2.29

/c ^h xəf χa-/ base: ø	Base-Identity	OCP	IDENT [cont]
c ^h xəf χa-		*!	
☞ c ^h xəf [q ^h]a-			*

Since Base-Identity refers to the base and not to the input, this ranking always derives the correct output no matter of the input value. This is illustrated in the tableau below in which the verbal stem initiates with a plosive in the input (à la Shiraishi (2000)).

2.30

/c ^h xəf q ^h a-/ base: ø	Base-Identity	OCP	IDENT [cont]
☞ c ^h xəf q ^h a-			
c ^h xəf [χ]a-		*!	*

The present analysis correctly derives the observed output no matter of the input. There is thus no prespecification, in which input strings are fixed to take a particular form. Nor does it make use of information of category labels, a condition that was inevitable in previous descriptions in order to let hardening apply appropriately. The current analysis makes a totally different claim. There is no exception to the hardening rule (nominal stems), nor should the specific undergoer (verbal stems) be prespecified at the underlying level. Rather, the asymmetry of nominal and verbal stems follows from the existence of a base, which is an independent fact of the language. By making use of such morpho-lexical information, the current analysis accounts for the noun-verb asymmetry without appealing to language-specific stipulations.

3. Final Fricative Devoicing

Base-Identity plays a crucial role in another phonological phenomenon of Nivkh. In this section, I will discuss such a case.

3.1. Distribution of laryngeal features

Like Danish, a full contrast of laryngeal features of Nivkh obstruents is realized only at the stem-initial position, which is the most prominent position as in many other languages (cf. Beckman 1996). In other positions, laryngeal features do not exercise a phonemic contrast and the feature value at the surface level is predictable from the context (Jakobson 1957: 83). In principle, non-prominent (stem-medial and final) positions only allow non-aspirated plosives and voiced fricatives. Aspirated plosives and voiceless fricatives, on the other hand, are excluded from these positions. Following Jakobson (1957), I will call them the *lenis* and *fortis* series, respectively.

3.1	Lenis obstruents	non-aspirated plosives	: p t c k q	
		voiced fricatives	: v r z ʝ ʒ	
	Fortis obstruents	aspirated plosives	: p ^h t ^h c ^h k ^h q ^h	
		voiceless fricatives	: f r s x ɣ	
3.2	pal	‘forest’	ətək	‘father’
	p ^h al	‘floor’	əkən	‘mother’
	ra-d ^j	‘to drink’	ova	‘flour’
	řa-d ^j	‘to bake’	muvi	‘porridge’
			eri	‘river’

There are two exceptional contexts in which a voiceless fricative appears in a non-prominent position: i) when preceding a plosive, and/or ii) before an I[ntonational] P[hrase] boundary (Jakobson 1957: 83).

3.3	a. esqa-d ^j	‘to hate’
	taft ^j	‘salt’
	kins	‘evil spirit’
	kins k ^h u-d ^j	‘to kill an evil spirit’
	c ^h xəf	‘bear’

$c^h x \text{ə} f k^h u - d^j$	‘to kill a bear’
als	‘berry’
als $p^h e -$	‘to pick berries’
b. nivx	‘human’
erx	‘to him/her’

The examples in 3.3b indicate that it is only the absolute final position which matters; the fricative second from the right appears as voiced. In Nivkh, there are no words ending in consecutive voiceless fricatives, indicating that voicelessness is required only for the very last fricative in an IP. I assume this to be due to a restriction which I will call Final Fricative Devoicing (FFD). FFD targets every final fricative within an IP.

Stem-final voiceless fricatives appear as voiced, however, as soon as the above-mentioned conditions are removed. Thus if a stem-final fricative is embedded in an IP, i.e. not final in the domain, and if it is not adjacent to a plosive it becomes voiced (3.4a). This is in concordance with the phonotactics of stem-medial fricatives which are always voiced (3.4b) unless adjacent to a plosive. This distribution is not surprising since stem-medial fricatives are expected not to coincide with an IP-boundary.

3.4 a.	$[kinz it -]_I$	‘go insane’
	$[c^h x \text{ə} v l \text{ə} j -]_I$	‘to kill a bear’
	$[alz \eta a -]_I$	‘to pick berry’
b.	ezmu-	‘to like~’
	urla	‘good’
	paɿla	‘red’

Outside of these two contexts, only lenis obstruents appear in non-prominent positions. Apparently, lenis obstruents have more distributional freedom than fortis obstruents, indicating their unmarked status in the phonology of Nivkh. Since non-prominent positions are predictably occupied by lenis obstruents, I assume that obstruents in these positions are unspecified for laryngeal features in the underlying form. Unless context-sensitive requirements contravene, obstruents without laryngeal specifications surface as lenis, the unmarked obstruent of the language.

3.2. Base-Identity in suffixation

Having discussed the unmarked nature of the lenis obstruents, we are now ready to look at the way FFD interacts with Base-Identity. Such a case arises when a suffix attaches to a fricative-final stem.

Like stem-medial and final positions, the initial obstruent of a suffix does not exhibit a laryngeal contrast, indicating that it is a non-prominent position. Except for a few exceptional cases, only lenis obstruents are allowed.¹⁰

3.5	-tox/rox/dox	allative (case suffix)
	-ɣu/gu/ku	plural
	-tʃ/dʃ	infinitive
	-gu/ku	causative

When affixed to a stem, the redundant [+voice] specification of the stem-final segment spreads to the initial obstruent of the suffix.

3.6	ra-dʃ	‘to drink-INF’
	pil-dʃ	‘big-INF’
	amam-dʃ	‘to walk-INF’
	ifk-tʃ	‘to harness-INF’
	jup-tʃ	‘to bind-INF’
	ro-gu-dʃ	‘to help-CAU-INF’
	lət-ku-dʃ	‘to do-CAU-INF’
	c ^h am-gu	‘shaman-PL’
	c ^h am-dox	‘shaman-ALL’

There is an interesting discrepancy between fricative-final nominal and verbal stems in this context; following a verbal stem, the initial segment of a suffix is always voiced (3.7a), while following a nominal stem, it is always voiceless (3.7b).

3.7	a.	fuv-dʃ	‘to blow/to saw-INF’
		iɣ-dʃ	‘to kill-INF’
		təvɣ-dʃ	‘to go inside the house-INF’
		jar-dʃ	‘to feed-INF’
		roz-gu-dʃ	‘to divide-CAU-INF’
		təmz-gu-dʃ	‘drop-CAU-INF’

b.	kins-ku	‘evil spirit-PL’
	c ^h xəf-ku	‘bear-PL’
	orŋr-ku	‘Uilta-PL’
	təf-tox	‘house-ALL’
	tiŋr-tox	‘wood-ALL’

The reason of this discrepancy is not immediately clear. In particular, the final voiceless fricative of nominal stems is a mystery. Being affixed by a suffix, it is no longer in the context of FFD, so nothing prevents it from appearing in the unmarked voiced fricative. In fact, this is the case with verbal stems; final fricatives of verbal stems are systematically voiced (3.7a). The other context-sensitive requirement, namely, the precedence to a plosive cannot be the reason either since these suffixes have a voiced variant, which surfaces when following a (redundant) [+voice] segment (3.6, 3.7a). The derivatives of verbal stems in 3.7a show that the initial plosive of these suffixes can accommodate a (preceding) voiced fricative, unlike plosives in a stem. But in fact, this option is not adopted in nominal stems. In short, these context-sensitive requirements cannot explain the different behavior of final-fricatives in nominal and verbal stems.

Under Base-Identity, however, such a discrepancy is explicable. Recall that nominal and verbal stems have different morpho-lexical compositions. Nominal stems can surface without any morphological ending, making the last fricative target of FFD. In contrast, final fricative of a verbal stem is always followed by a morphological extension, making it irrelevant to FFD. Since Base-Identity claims that derivatives should phonologically conform to the base, nominal derivatives conform to their base, which ends in a voiceless fricative (due to FFD). This is not the case, however, for verbal stems since they have no base and therefore do not underlie such pressure. As a consequence, verbal stems undergo canonical phonology and fricatives in non-prominent positions do appear as lenis, the unmarked obstruents of the language.

Finally, it is important to note that reference to laryngeal specifications using Input-to-Output correspondence constraints is not a viable option in this context. Recall that there is no laryngeal contrast in stem-final position in Nivkh. A phonological theory which minimizes the specification of predictable features in underlying representations, which is the one adopted here, makes it impossible for Input-to-Output constraints to refer to the voiceless status of stem-final fricatives.¹¹ Thus their voicelessness should

come from somewhere else. According to the current analysis it originates from the base, the independently occurring isolated form.

4. Conclusion

In this paper I have discussed phonological asymmetries between nominal and verbal stems of Nivkh, as observed in two phonological phenomena CA and FFD. Though the asymmetries themselves look very different on the surface, this article has made explicit that they are subject to a common generalization, Base-Identity. Given the asymmetric composition of nouns and verbs, Base-Identity makes two predictions: i) nominal and verbal derivatives exhibit different phonological patterns, and ii) it is the nominal stem which exhibits the non-canonical phonology given the strong pressure from the base. Both predictions were borne out in the phonological phenomena discussed above. The base plays a decisive role in computing the phonology of nominal and verbal derivatives in both CA and FFD. As for CA, the current analysis correctly predicts that nominal derivatives accommodate the otherwise illicit segmental sequence (fricative-fricative, nasal-fricative), while verbal derivatives do not. This analysis is superior to previous accounts since it makes no direct use of the notion of exception, which was inevitable in previous works. Rather, the suggested analysis relates the asymmetry in phonology to the compositional asymmetry between nouns and verbs.

As for FFD, nominal derivatives showed conformity to their base, in ending in a voiceless fricative. Verbal stems on the other hand, do not show such conformity since they lack a base. Unlike nominal derivatives, the stem-final fricatives of verbal derivatives appear as lenis, following the canonical phonology of Nivkh. Base-Identity provides us with the mechanism underlying the noun-verb asymmetry, and it correctly predicts their phonological behavior with respect to the canonical phonology of the language.

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Notes

- 1 “...identity effects will come into play only to the extent that the immediate constituents composing the complex structure constitute independently occurring outputs...(Kenstowicz 1996: 373)”, “The base of an OO-correspondence relation is a licit output word, which is both morphologically and phonologically well-formed (Benua 1997a: 29)”, “The bound form of a stem is segmentally identical with its corresponding free form (Ito and Mester 1997: 431)”.
- 2 The rhotic *r* of Nivkh is classified here and elsewhere in the literature (e.g. Trubetzkoy 1939) as a voiced fricative since it patterns as such in the CA system. Its voiceless counterpart *ɾ* is an apical trill containing portions without vocal cord vibration (Ladefoged and Maddieson 1996: 236).
- 3 Regarding this nature of CA, one may postulate a single laryngeal feature (rather than two) for both plosives and fricatives, e.g. [+spread glottis] for both aspirated plosives and voiceless fricatives. Such an analysis is proposed by Jakobson (1957) and Blevins (1993). See also section 3 below.
- 4 Segments that underwent CA are put in square brackets. Abbreviations are: ALL= allative, asp= aspiration, I=Intonational phrase, INF=infinitive, NP = noun phrase, PL= plural, VP = verb phrase, XP = maximal projection.
- 5 The alternation (*r* >) *t* > *d* is due to post-nasal voicing.
- 6 CA exhibits aspects of prosodic phonology (I am using this term to contrast with lexical phonology); it is sensitive to pause insertions and to speech rate. I would classify it as a P-structure rule in the terminology of Selkirk (1986). P-structure rules exhibit phonological properties of prosodic phonology, yet they are sensitive to syntactic bracketing (Selkirk 1986).
- 7 This line of analysis has antecedents. Amongst them are: Kenstowicz and Kisserberth (1979), Rushchakov (1981), Kaisse (1985), and Blevins (1993). Interestingly, Lev Shternberg, the pioneer of Nivkh study, assumed plosive-initial forms to be the input to transitive structures, as well (Shternberg 1908).
- 8 Spirantization and hardening are not ordered relative to each other in the tableau below.
- 9 Post-nasal context requires different markedness constraint but I omit it from the discussion below. See Shiraishi (2000) for details.
- 10 Following a velar or a uvular plosive, the initial velar of a suffix appears as [x], spirantizing the former at the same time: *ətəx-xu* < *ətək*+PL ‘fathers’.
- 11 On the other hand, OO-constraints are known to be able to make reference to non-contrastive features. See Benua (1997b) and Steriade (1999) for such cases.

Bibliography

- Austerlitz, R. (1977) The study of Paleosiberian languages. In D. Armstrong and C. van Schoonveld (eds.) *Roman Jakobson: Echoes of His Scholarship*. Lisse: Peter de Ridder Press. 13-20.
- Beckman, J. (1996) *Positional Faithfulness*. PhD Dissertation, University of Massachusetts, Amherst.
- Benua, L. (1997a) *Transderivational Identity: Phonological Relations between Words*. PhD dissertation, U.Mass, Amherst.
- _____ (1997b) Affix classes are defined by faithfulness. In V. Miglio and B. Moren eds. 1-26.
- Blevins, J. (1993) Gilyak lenition as a phonological rule. *Australian Journal of Linguistics* 13, 1-21.
- Burzio, L. (1996) Surface constraints versus underlying representation. In J. Durand and B. Laks (eds.), 125-144.
- _____ (1997) Strength in Numbers. In V. Miglio and B. Moren (eds.), 27-52.
- _____ (2002) Missing players: Phonology and the past-tense debate. *Lingua* 112, 157-199.
- Chomsky, N. and M. Halle (1968) *The Sound Patterns of English*. New York: Harper & Row.
- Durand, J. and B. Laks (eds.) *Current Trends in Phonology: Models and Methods*. Salford, Manchester, University of Salford Publications.
- Hattori, T. (1962) Versuch einer Phonologie des Südostgiljakischen (II) – Alternation. *Journal of Hokkaido Gakugei University (Sapporo)* 13-2. 29-96.
- Inkelas, S, O. Orgun and C. Zoll (1997) The Implications of Lexical Exceptions for the Nature of Grammar. In I. Roca (ed.), 393-418.
- Ito, J. and A. Mester (1997) Correspondence and Compositionality: The Gango Variation in Japanese Phonology. In I. Roca (ed.), 419-462.
- Jakobson, R. (1957) Notes on Gilyak. *Roman Jakobson. Selected Writings II. Word and language*. The Hague and Paris: Mouton. 72-102.
- Kaisse, E. (1985) *Connected Speech*. Orlando: Academic Press.
- Kenstowicz, M. (1996) Base-Identity and Uniform Exponence: Alternatives to Cyclicity. In J. Durand and B. Laks (eds.), 365-395.
- _____ (1997) Uniform exponence: Exemplification and extension. In V. Miglio and B. Moren (eds.), 139-155.
- Kenstowicz, M. and C. Kisserberth. (1979) *Generative Phonology: description and theory*. New York: Academic Press.
- Krejnovich, E. (1937) *Fonetika nivxskogo (giljackogo) jazyka* [Phonetics of the Nivkh (Gilyak) language]. Moskva - Leningrad: Uchpedgiz.

- Ladefoged, P. and I. Maddieson. (1996) *The Sounds of the World's Languages*. Oxford: Blackwell.
- Miglio, V. and B. Moren (eds.) (1997) *University of Maryland Working Papers in Linguistics*, vol.5.
- Nepor, M. and I. Vogel (1986) *Prosodic Phonology*. Dordrecht: Foris.
- Roca, I. (ed.) (1997) *Derivations and Constraints in Phonology*. Oxford: Clarendon Press.
- Rushchakov, V. (1981) *Akusticheskie xarakteristiki soglasnyx nivxskogo jazyka* (avtoreferat). Ph.D.dissertation, Akademija Nauk CCCP, Leningradskoe otdelenie instituta jazykoznanija.
- Savel'eva, V. and C. Taksami. (1970) *Nivxsko-russkij slovar*. [Nivkh-Russian dictionary] Moskva: Sovetskaja Enciklopedija.
- Selkirk, E. (1986) On derived domains in sentence phonology. *Phonology Yearbook* 3. 371-405.
- Shiraishi, H. (2000) Nivkh consonant alternation does not involve hardening. *Journal of Chiba University Eurasian Society* No.3. 89-119 (Also available from www.let.rug.nl/~toshi/list_of_publication.htm). Abridged version has appeared in the *Proceedings of the 120th meeting of the Japanese Society of Linguists*. 42-47.
- Shternberg, L. (1908) Materialy po izucheniju giljackogo jazyka i fol'klora. In: *Obrachy narodnoj slovesnosti* Vol. 1, Part I. St.Petersburg: Imper. Akademii Nauk.
- Steriade, D. (1999) Paradigm Uniformity and the Phonetics-Phonology boundary. In M. Broe and J. Pierrehumbert (eds.), *Papers in Laboratory Phonology 5*. Cambridge: Cambridge University Press.
- Trubetzkoy, N. (1939) *Grundzuge der Phonologie*. Prague: Travaux du Cercle Linguistique de Prague.