

Phonologically Conditioned Allomorphy in the Morphology of Surmiran (Rumantsch)

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ABOUT TWENTY YEARS AGO, Andrew Carstairs (1986, 1988) discussed some examples that seemed to fall inconveniently between the stools of phonology and morphology: cases where some alternation whose *form* is not plausibly attributed to the operation of phonological rules nonetheless seems to be conditioned by factors that are purely phonological. These examples then lay more or less fallow for more than a decade, apart from occasional attempts to deny their existence. With the rise of Optimality Theory (Prince & Smolensky 2004, originally circulated in 1993), however, tools to handle such phenomena appeared to be at hand, and examples like those cited by Carstairs were revived to some extent as instances in which the actual input form, and not just its output correspondent, could be subject to selection by the constraint system. The principal reference here is a paper by René Kager (2007; actually written a number of years earlier), with additional contributions from other scholars in recent years. A current collection of papers on allomorphy (Tranel to appear) contains several papers dealing with these issues.

Most examples that have been treated in the literature occupy quite limited space in the sound pattern of the language concerned, consisting of a small set of affixes or a limited, closed class of stem alternations. This could give the impression that such

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phonologically conditioned allomorphy really is to be closeted in the morphology, somewhere near suppletion.

In this paper, I wish to discuss an example where this kind of alternation has taken over nearly all of the phonologically conditioned variation in the language, and is clearly not marginal at all. The language to be described is Surmiran, a form of Swiss Rumantsch, though it should be noted that essentially the same situation obtains in other forms of Rumantsch, and apparently in some nearby languages of Italy as well. Whether the specific analysis proposed here extends to a full range of Swiss Rumantsch languages (and perhaps beyond) must await further detailed examination, but even a cursory examination of facts surveyed in Decurtins 1958 and in descriptive grammars of the various languages will make clear the very general nature of the phenomenon.

The Rumantsch languages of Switzerland are often seen as part of a wider group of “Rhaeto-Romance” languages, including several Ladin dialects spoken in the Dolomites of Italy and Friulian as well. A review of the issue by Haiman & Beninca (1992), however, suggests that there is no serious evidence for such a grouping as a genetic unit. The languages in (1) are simply Romance languages with a certain amount of structural similarity spoken in close geographical proximity, but no apparent common developments that would establish a more specific connection among them.

(1)

Swiss Rumantsch				
Engadine	Central	Western	Dolomitic Ladin	Friulian
Puter	Surmiran	Sursilvan	Gardena	Friulian
Vallader	(Bergün)		Gadera	
(Val Müstair)	(Obervaz)		Fassa	
	Sutsilvan		Livinallongo	
			Ampezzo	

In this chart, the Swiss Rumantsch languages with distinct codified orthographies are unparenthesized, though the actual degree of variation (including the parenthesized forms, among many others) is much greater than this. Unless otherwise identified, the language described here is the standard form of Surmiran that is taught in local schools in the area of Savognin, used in the newspaper *La Pagina da Surmeir*, and presented in descriptions such as Signorell et al. 1987 and Capeder 2006.

Surmiran, like other forms of Rumantsch (and the Romance languages more generally) displays a great deal of stem-shape variation in its morphology. Pedagogically oriented descriptions highlight its role in verbal alternation; in part this is simply a matter of the “irregular verbs” whose memorization is the bane of the language learner. There is also a good deal of variation which is quite systematic, however. Although

controlled by phonological factors, the variation in shape displayed by verbal stems in Surmiran is nonetheless lexically determined and not simply the product of the operation of phonological rules. Once the patterns of alternation are identified, they turn out to be more pervasive, affecting derivational and other morphology as well and constituting a characteristic feature of the language's structure.

I Regular and Irregular Verbs

VERBS IN SURMIRAN belong in general to one of six overall classes, as distinguished by their infinitive forms and by the vowels that appear in the suffixes of certain inflected forms. The largest and most productive of these is the class of verbs in *-ar*; Figure 1 (derived from Signorell et al. 1987, p. 67) summarizes the main points of the system. Note that the difference between phonetically open ([ɛ, ɔ]) and closed ([e, o]) mid vowels is not reflected in Surmiran orthography, nor is the difference between unstressed [ə] (*a, e*) and full stressed vowels ([a, e, ɛ]).

Inf.	Example	1pl. Pres.	1sg Imprf.	1sg Fut.	1sg Cond.	PPpl.
-ar [-ar]	<i>cantar</i> 'sing'	-agn	-ava	-aro	-ess	-o/ada
-er [-er]	<i>lascher</i> 'leave'	-agn	-eva	-aro	-ess	-ea/eda
-ier [-iər]	<i>spitgier</i> 'expect'	-agn	-iva	-aro	-ess	-ia/eida
-eir [-ejr]	<i>tameir</i> 'fear'	-agn	-eva	-aro	-ess	-ia/eida
-er [-ər]	<i>tanscher</i> 'reach'	-agn	-eva	-aro	-ess	-ia/eida
-eir [-ejr]	<i>parteir</i> 'depart'	-ign	-iva	-iro	-iss	-ia/eida

Figure 1: Surmiran Conjugations

Finite (inflected) forms of the verb in Surmiran include the Present, Imperfect and Future Indicative, the Present and Imperfect Subjunctive (identical with the Conditional) and the Imperative; non-finite forms include the Infinitive, the Gerund (or Present Participle) and the (Past or Perfect) Participle. Most of our attention here will be focused on the Present Indicative, for which a representative paradigm is given in (2).

(2) *cantar* 'sing' (Pres. Indic.):

1sg	(ia) cant	[kant]
2sg	(te) cantas	['kantəs]
3sg	(el) canta	['kantə]
1pl	(nous) cantagn	[kən'taŋ]
2pl	(vous) cantez	[kən'tɛts]
3pl	(els) cantan	['kantən]

As can be seen here, the Present Indicative of a regular verb such as *cantar* is formed from the stem of the verb stem plus a set of suffixes: $-\emptyset$, $-\text{əs}$, $-\text{ə}$, $-\text{a}\eta$ ($-\text{i}\eta$ with verbs in $[-\text{ejr}]$), $-\text{ets}$ ($-\text{its}$ with verbs in $[-\text{ejr}]$), and $-\text{ən}$. Stress falls on the root, except in the first and second person plural forms, where it falls on the suffix.

In addition to “regular verbs” like *cantar*, Surmiran has a number of irregular verbs whose paradigms are not as straightforward as that in (2). Consider the paradigms of some of these, given in Figure 2.

	<i>eir</i> ‘go’	<i>neir</i> ‘come’	<i>(vu)leir</i> ‘want’	<i>deir</i> ‘say’	<i>star</i> ‘stay, live’	<i>saveir</i> ‘know’
1sg	vign	vign	vi	dei	stung	sa
2sg	vast	vignst	vot	deist	stast	sast
3sg	vo	vign	vot	dei	stat	so
1pl	giagn	nign	lagn	schagn	stagn	savagn
2pl	gez	niz	lez	schez	stez	savez
3pl	von	vignan	vottan	deian	stattan	son

Figure 2: Some Irregular Verbs in Surmiran

As in other Romance languages, these (and other) irregular paradigms are not completely unrelated to those of regular verbs, or to one another, but nonetheless display considerable idiosyncrasy. As a first approximation, we might assume that a completely regular verb like *cantar* need list nothing in the lexicon besides its stem ($/\text{kant-}/$), with the inflected forms of (2) being produced by rule from this. The only variation in stem shape is between (stressed) $[\text{a}]$ and (unstressed) $[\text{ə}]$, not reflected in the orthography. It is tempting to regard this as merely a matter of low level phonetics, but it is worth noting that $[\text{a}]$, $[\text{e}]$ and $[\text{ə}]$ must be lexically distinguished, in order for instance to distinguish the infinitival endings of the first and second conjugations in Figure 1 from the fifth.

In contrast, irregular verbs like those in Figure 2 must list their individual forms, each specified for person and number. The form *stung*, for example, is listed as $[\text{ʃtu}\eta]$ with the morphosyntactic features $[\text{+ME}, \text{-PL}, \text{+PRES +INDIC}]$ within the lexical entry for *star* ‘stay, live’. By well-known principles of disjunctive application (or ‘blocking’: see Anderson 1992 among many other references), this specifically characterized form will take precedence over one generated by rule.

We could say that regular and irregular verbs differ structurally in this way, then. The former have only a single stem listed in their lexical entry, a base which is not specified for morphosyntactic properties, while the latter have stem forms characterized for specific combinations of features (perhaps in addition to one or more ‘default’

stems). As we will see in the following section, however, this distinction does not exhaust the range of possibilities in the Surmiran lexicon.

2 “Alternating” Verbs

COMPARE THE PARADIGMS IN (3) with that of a regular verb like *cantar* shown in (2) or those of irregular verbs in Figure 2.

(3)	<i>ludar</i> ‘praise’	<i>durmeir</i> ‘sleep’	<i>lavar</i> ‘get up’	<i>fittar</i> ‘finish’
1sg	lod	dorm	lev	fet
2sg	lodas	dormas	levas	fettas
3sg	loda	dorma	leva	fetta
1pl	ludagn	durmign	lavagn	fittagn
2pl	ludez	durmiz	lavez	fittez
3pl	lodan	dorman	levan	fettan

Each of the verbs in (3) displays two distinct stems: [lod]/[lud], [dorm]/[durm], [lev]/[lɔv], and [fet]/[fit]. The first variant occurs with all three persons of the singular, and in the third plural, while the second variant occurs in the first and second person plural. It is the relation between these two stem variants that constitutes the primary focus of this paper.

2.1 The Conditions for the Alternation

We might be tempted to treat these alternating verbs together with irregular verbs like those in Figure 2. On this approach, we could list the first stem variant in each case with no morphosyntactic properties (thus making it the default), and the second with the properties [+ME, +YOU], +PL]. Alternatively, we could treat the second stem as the default, and specify the first as associated with the features [-PL], [-ME, -YOU]]. The intuition beyond such an analysis is the claim that the choice between stems is an essentially *morphological* one. That this is not simply a straw man is shown by the fact that, as argued in detail by Maiden (1992, 2005), a wide variety of Romance languages show just such a pattern of allomorphic variation (called by Maiden “N-pattern alternation”) in the absence of any non-morphological definition of the conditions involved.

This approach fails for Surmiran, however. Notice first that outside the present indicative (and the imperative), the association with features suggested above does not hold. On the one hand, the present subjunctive, like the singular imperative, is

uniformly built from the same stem as the singular forms of the present indicative, in all persons and numbers, as illustrated in (4).

(4)	<i>ludar</i> ‘praise’	<i>durmeir</i> ‘sleep’	<i>lavar</i> ‘get up’	<i>fittar</i> ‘finish’
1sg	loda	dorma	leva	fetta
2sg	lodas	dormas	levas	fettas
3sg	loda	dorma	leva	fetta
1pl	lodan	dorman	levan	fettan
2pl	lodas	dormas	levas	fettas
3pl	lodan	dorman	levan	fettan
2sg Imperative	loda!	dorma!	leva!	fetta!

On the other hand, a number of other tenses, including the imperfect, the future, the conditional, as well as the plural of the imperative and the present participle are built with equal consistency from the same stem as the first and second person plural of the present indicative, as illustrated in (5).

(5)	infinitive:	<i>ludar</i>	<i>durmeir</i>	<i>lavar</i>	<i>fittar</i>
1pl Pres.		ludagn	durmign	lavagn	fittagn
1sg Imperf.		ludeva	durmiva	laveva	fitteva
1sg Fut.		ludaro	durmiro	lavaro	fittaro
1sg Condit.		ludess	durmiss	lavess	fittess
2pl Imper.		lude!	durmi!	lave!	fitte!
Pres. Ppl.		ludond	durmond	lavond	fittond

Furthermore, the infinitive does not bear either of the feature sets purportedly associated with one of the stems. Nonetheless, the infinitive of verbs from five of the six types in Figure 1 consistently shows the same stem as that of the first and second person plural (e.g., *ludar*, *durmeir*, *lavar*, *fittar*), as opposed to the infinitive of verbs of the remaining (fifth) class. Infinitives of the latter, the verbs that form their infinitive with [-ər], are based on the first stem (that found in the singular of the Present Indicative). Thus, *discorrer* [diʃ'korər] ‘speak’ uses the same stem in the infinitive as in 1sg Present *discor*, and not that of the 1pl Present form *discurrign*.¹

¹Martin Maiden calls my attention to the Grisch’s observation (1939, p.222) that occasional forms occur in which infinitives that normally bear desinential stress take stem stress instead: [ˈpeləər, ˈtɪjər, ˈtəpər] instead of standard [pɪˈləər, tɪˈjɛr, tɛˈpər]. Since the shift of stress in these forms is accompanied by a change in the stem to the shape normally associated with stem stress, they would also support the proposed association of stem shape with the phonological property of stress, rather than a morphologically defined distinction. The forms Grisch cites, however, are taken from the dialect of Vax (cf. Ebnetter 1981), which is distinct in some important ways from the Surmiran of Savognin discussed in this paper, and I am reluctant to interpret them as direct evidence for the present analysis.

It does not appear, therefore, that a coherent definition of the conditions of use of each of the two shapes in which such “alternating” stems occur is possible in terms of morphosyntactic features. Signorell et al. 1987, p. 68 (and the related dictionary of Signorell 1999) suggest that the forms in (5) are actually derived from the first person plural present indicative, while the others are derived from the third singular present indicative, but no such appeal to “parasitic derivations” is required.

In fact, following the earlier description in Sonder & Grisch’s (1970) dictionary, there is a simple regularity that governs the distribution of the two stem variants: the one appearing in the 1pl present and the other categories in (5) is used precisely when the main stress of the form is on the ending, while the stem shape associated with categories such as the present indicative singular and others built on the same form is used precisely when the ending is unstressed (or phonetically null, in the 1sg present indicative), and main stress falls on the root. The infinitive forms illustrate this nicely: the ending [-ər] is unstressed, and so infinitives in this class have stress on the root, while all other variants of the infinitive ending in Figure 1 themselves take stress. The associated difference in stem alternants on which the infinitive is based is simply another instance of the same principle that obtains throughout the paradigm.

2.2 Stressed And Unstressed Syllables in Surmiran

Since stress is evidently the conditioning factor for the stem alternations, it is necessary to say a few words about how it is assigned before proceeding further. The influx of borrowings, especially from German, has somewhat obscured the basic principles, since many such words have exceptional stress. Within the native (and nativized) vocabulary, however, there is a relatively simple regularity. Main stress falls on the penult if the rhyme of the final syllable consists of [ə], possibly followed by [r], [l], [n] or [s]. If the final syllable contains a full (non-ə) vowel, or if the final consonant is other than one of those just listed (e.g., final syllables in [əm]), main stress is on the last syllable. Assuming that syllable rhymes of the form [ə] plus [r,l,n,s] are light, and others are heavy, this can be described by the rule in (6).

- (6) Build a quantity-sensitive trochee at the right edge of the word.

Parts of compounds are stressed separately with main stress on the stress center of the final element.

In addition to the main stress, secondary stress falls on initial syllables separated by at least one syllable from the main stress. Other secondary stresses appear to be the result of cyclic word formation, although the principles at work have not yet been fully worked out.

Stressed syllables can contain a variety of vowels and diphthongs, with long vowels and diphthongs restricted to primary stressed syllables. Unstressed syllables, however, normally contain only short [ə] (written *a* or *e*), [ɪ] or [ʊ], although short mid vowels also occur in some unstressed syllables as a result of borrowing.

When we look again at a “regular” verb like *cantar* in (2), we see that in fact (as already noted above) the stem shows two alternants, distributed in the same way as in the “alternating” verbs of (3): [kənt] before endings that bear stress, and [kant] when main stress falls on the root. The difference is obscured here by the orthography, which represents (stressed) [a] and (unstressed) [ə] in the same way, as orthographic *a*, but there is a difference nonetheless.

The nature of the stem variation in *cantar* suggests an account of the alternating verbs. The difference between the two stems of verbs like those in (3) is a matter of vowel quality, with the “unstressed” stem always displaying an appropriate vowel from the reduced set in its final syllable, while the “stressed” stem may have essentially any vowel. Whether the main stress falls on the root or on the ending, furthermore, is reflected in whether that stress falls on the vowel that differentiates the two stem shapes or not. Perhaps the difference between the two stems is simply a consequence of a phonological rule relating the vowel systems of stressed and unstressed syllables, as seems plausible for the alternation in [ˈkant] ‘I sing’ *vs.* [kənˈtaŋ] ‘we sing’. We might assign these verbs a single underlying stem shape and derive the alternative form by a phonological rule of vowel reduction in unstressed syllables. We will see, however, that matters are not as straightforward as that.

2.3 Vowel Alternations in Verbs

In order to reduce the stem alternation to a phonological rule of vowel reduction in unstressed syllables, we must be able to find a unitary underlying form for each verb from which both of its stems can be derived by rule. It is fairly obvious that the unstressed alternant cannot serve this purpose. As we have just observed, only three vowels normally appear in unstressed syllables: [ə] (orthographic *a* or *e*), [ɪ] (orthographic *i*) and [ʊ] (orthographic *u*). When [ə] appears in the unstressed alternant, the corresponding stressed alternant may contain any of at least eight distinct vowels and diphthongs, as illustrated in (7).

(7) Stressed V	Infinitive	3sg Pres. Indic.	gloss
[a]	<i>l[ə]var</i>	<i>l<u>a</u>va</i>	‘wash’
[ai̯]	<i>[ə]ntr<u>a</u>r</i>	<i>ai<u>n</u>tra</i>	‘enter’
[ɛ]	<i>t[ə]d<u>l</u>ar</i>	<i>te<u>d</u>la</i>	‘listen’
[e]	<i>l[ə]v<u>a</u>r</i>	<i>l<u>e</u>va</i>	‘get up’
[ɛi̯]	<i>p[ə]s<u>a</u>r</i>	<i>pe<u>s</u>a</i>	‘weigh’
[ei̯]	<i>antsch[ə]d<u>a</u>r</i>	<i>antsche<u>i</u>da</i>	‘start yeast’
[i]	<i>surv[ə]g<u>n</u>eir</i>	<i>surv<u>i</u>gn</i>	‘receive’
[o]	<i>cl[ə]m<u>a</u>r</i>	<i>cl<u>o</u>ma</i>	‘call’

Minimal pairs such as *lavar/lava* ‘wash’ vs. *lavar/leva* ‘get up’ make it clear that no other properties of the environment are likely to be available to disambiguate these relations.

Similarly, unstressed [ɪ] can correspond to any of at least eight different vowels and diphthongs in the stressed alternant, as illustrated in (8).

(8) Stressed V	Infinitive	3sg Pres. Indic.	gloss
[a]	<i>(sa) t<u>g</u>il[ɪ]ttar</i>	<i>t<u>g</u>il<u>a</u>tt<u>a</u></i>	‘sit down (scornfully, as of a cat)’
[ai̯]	<i>spis<u>g</u>[ɪ]ntar</i>	<i>spis<u>g</u>ia<u>i</u>nta</i>	‘feed’
[ɛ]	<i>p[ɪ]g<u>l</u>ier</i>	<i>pe<u>g</u>lia</i>	‘take’
[e]	<i>f[ɪ]m<u>a</u>r</i>	<i>f<u>e</u>ma</i>	‘smoke’
[ei̯]	<i>anv[ɪ]d<u>a</u>r</i>	<i>anv<u>e</u>ida</i>	‘invite’
[i]	<i>t<u>g</u>[ɪ]r<u>a</u>r</i>	<i>t<u>g</u>ir<u>a</u></i>	‘guard’
[iə]	<i>s[ɪ]v<u>a</u>r</i>	<i>s<u>i</u>eva</i>	‘sweat’
[o]	<i>dum[ɪ]g<u>n</u>ar</i>	<i>dum<u>o</u>gna</i>	‘dominate’

Finally, unstressed [ʊ] can correspond to at least seven distinct stressed vowels and diphthongs, as illustrated in (9).

(9) Stressed V	Infinitive	3sg Pres. Indic.	gloss
[a]	<i>v[ʊ]r<u>d</u>ar</i>	<i>v<u>a</u>rda</i>	‘watch’
[ɔ]	<i>d[ʊ]r<u>m</u>eir</i>	<i>d<u>o</u>rma</i>	‘sleep’
[o]	<i>cr[ʊ]d<u>a</u>r</i>	<i>cr<u>o</u>da</i>	‘fall’
[o:]	<i>p[ʊ]s<u>s</u>ar</i>	<i>p<u>â</u>ssa</i>	‘rest’
[oi̯]	<i>l[ʊ]i<u>e</u>r</i>	<i>l<u>o</u>ia</i>	‘arrange’
[ou̯]	<i>ram[ʊ]r<u>a</u>r</i>	<i>ram<u>o</u>ura</i>	‘roll, surge’
[u]	<i>p[ʊ]g<u>n</u>ier</i>	<i>p<u>u</u>gna</i>	‘fight, box’

An examination of the data in (7–9) should make it clear that the choice of the stressed alternant will not succeed either, since the same stressed vowel can correspond to more than one (and in some cases, such as [a] and [o], to all three) unstressed vowels. Indeed, there are very few stressed vowels whose unstressed correspondent is unique. The variation between the two alternative stems for a given verb, then, cannot be derived from the phonology alone.

This is not to deny that historically, the source of these alternations was phonological. Roughly, the system that is found in stressed syllables, consisting of seven vowels, each long or short, and a number of diphthongs, was collapsed to three short reduced vowels in unstressed position. Low vowels (including [a, ɛ, and ɔ] reduced to [ə] in unstressed syllables, while non-low front vowels ([i, e]) reduced to [ɪ] and non-low back vowels to [ʊ]. For the details of these developments, see Lutta 1923, pp. 120–136, Grisch 1939, pp. 76–94 and Eichenhofer 1989.

As emphasized by Haiman & Beninca (1992, pp. 56–63), however, the history of individual words is nowhere near so simple in Surmiran or any of the other forms of Swiss Rumantsch as a mere rule of vowel reduction in unstressed syllables. Intermediate historical stages in the development of the unstressed vowels are preserved in certain forms, and many have been restructured so that the alternations found today are by no means always the etymologically expected ones. Furthermore, borrowed words from German and other languages have introduced unstressed vowels other than [ə,ɪ,ʊ], contributing to the increasing opacity of the vowel reduction rule as a purely phonological generalization. It seems clear that the pattern of stem alternation was interpreted as a morphological property of individual verbs at an early point, and thereby became separated logically from the operation of the phonology so as to give rise to the system of phonologically conditioned stem allomorphy which we can observe in the modern language(s).

2.4 Consonant Alternations

The vowel changes we have seen thus far are by no means the only ways in which the two stress-conditioned alternant stems of verbs may differ. In a number of verbs, *gn* ([ɲ]) or *ng* ([ŋ]) following the stressed vowel of the stressed alternant corresponds to *n* ([n]) in the unstressed alternant, as in the verbs in (10).

(10)	Infinitive	3sg Pres. Indic.	gloss
	<i>manar</i>	<i>magna</i>	‘lead’
	<i>cuschinar</i>	<i>cuschigna</i>	‘cook’
	<i>splanar</i>	<i>splanga</i>	‘plane’
	<i>amplunar</i>	<i>amplunga</i>	‘pile up’

Sometimes this is accompanied by vowel change as well, as in (11).

(11)	Infinitive	3sg Pres. Indic.	gloss
	(<i>sa</i>) <i>sdanar</i>	<i>sdegna</i>	'shrink from doing s.t.'
	(<i>s'</i>) <i>anclinar</i>	<i>anclegna</i>	'bend'
	<i>smarschanar</i>	<i>smarschunga</i>	'loaf'

The nasal alternations, like those affecting vowel quality, have historical roots in phonologically governed patterns. At some point in the development of Surmiran, intervocalic /n/ following main stress became [ɲ] after front vowels and [ɲ] after back vowels. The dialect distribution of this change was rather complex, however, and exceptions soon developed, causing the regularity to become opaque and in part lexicalized (see Grisch 1939, pp. 74f.).

In modern Surmiran, the [n]/[ɲ] alternation is apparently predictable in many cases. Let us consider first the most productive class of verbs, those whose infinitives end in *-ar*. Of the approximately 90 verbs with infinitives ending in *-inar* that are listed in Signorell 1999, every one for which evidence is available² has a stressed stem in *-egn* or *-ign*. The palatalization of /n/ after stressed [i, e] is thus automatic in this case. Three verbs end in the sequence *-egnar*: *cregnar* 'soak', *impegnar* 'distrain (seize to obtain payment of money owed)', and *impregnar* 'impregnate, marinate'. The final [ɲ] in these is invariant, and the vowel quality suggests an exceptional secondary stress in the 'unstressed' stem form.

On the other hand, the [n]/[ɲ] alternation also appears in around a dozen *-ar* verbs with other vowels (e.g. *smanar/smagna* 'swing'), and here it cannot be an automatic concomitant of stress shift, because comparable verbs with non-alternating *n* also exist, such as those in (12).

(12)	Infinitive	3sg Pres. Indic.	gloss
	<i>anganar</i>	<i>angiona</i>	'swindle'
	<i>scanar</i>	<i>stgona/scana</i>	'stab'

The alternation must thus be a lexical characteristic of *-ar* verbs whose unstressed stem vowel is other than /i/.

Next consider *-ier* verbs. Among these, there are none that end in /-Vn/, but a number ending in /-Vɲ/. The same is true of verbs ending in stressed *-er*. These facts suggest that post-vocalic /n/ is obligatorily palatalized in these classes.

²A number of these verbs form their stressed stem by suffixing *-esch* as will be discussed below, and so do not have a form in which the relevant vowel takes the main stress.

Of the verbs ending in unstressed *-er* ([-əɾ]), there are a number whose stems end in non-alternating /n/. All of these appear to be prefixed forms based on a single root /pon/: *cumponer* ‘compose’, *deponer* ‘put down’, *opponer* ‘oppose’, etc. The suggestion, nonetheless, is that only /n/ and not /ɲ/ appears in either stem of verbs of this class.

Among the *-eir* ([-ɛiɾ] or [-eɪɾ]) verbs, there appears to be only one that is relevant: (s³)*accumplaneir/accumplagna* ‘come true’. There is no way to tell from this single case whether alternation should be considered optional or obligatory for such verbs.

To summarize: verbs belonging to classes whose infinitive ending is [-iəɾ] or [-er] display only non-alternating /ɲ/ and not /n/ in both their stressed and unstressed stems. Verbs whose infinitive ending is [-əɾ] (unstressed *-er*) display only /n/ and not /ɲ/ in both. There is very little evidence about verbs in the two *-eir* classes, although one verb does display an alternation (/ɲ/ in the stressed stem, /n/ in the unstressed).

Verbs in the highly productive *-ar* class have final /n/ in their unstressed stems, with the exception of three verbs that have invariant /ɲ/ after the vowel /e/. The stressed stems of these have [ɲ] after [i] or [e], and may have either [ɲ] or [n] after [a].

There are clearly generalizations to be found here about the distribution of [ɲ] and [n] at the ends of verb stems. These are, however, generalizations about the lexical structure of verbal stems. In the language as a whole, [ɲ] and [n] appear in contrast in a variety of environments, and it is not possible to state a purely phonological regularity (i.e., one that refers only to the phonological environment of the segments concerned) from which the generalizations true of verb stems would follow.

The status of [n]/[ɲ] alternations is somewhat different. This alternation only occurs in verbs of the *-ar* class, and generally only in stressed stems that have the vowel [u]. Every verb in Signorell 1999 that ends in *unar* in the infinitive and that has a stressed stem with stress on the [u] changes the /n/ to [ɲ] in this case, with one exception: *cugliunar/cugliuna* ‘cheat’. Similarly, every verb in *anar* that changes the stem /a/ to [u] also changes /n/ to [ɲ]. There appears to be a phonological regularity to the effect that stressed *un* at the end of a verb stem³ becomes [-uɲ].

This is consistent with other peculiarities of [ɲ] in Surmiran. This sound generally appears only (a) as a result of assimilation of [n] to a following velar, or (b) in final position, after a stressed vowel (almost always [+Back], apart from words in *-ing* borrowed from English like *surfing*), a position from which [n] is largely excluded. The segment [ɲ] is likewise excluded from appearance in final position after stressed [u] apart from the word *pugn* ‘fist’ and its derivatives. A great many nouns in the language end in *-iun*, which is consistently pronounced [i'uɲ]. The adjective *bun/buna*

³There appear to be no verbs belonging to classes other than the *-ar* verbs that have a stem ending in stressed [un], so it is not possible to determine the scope of this regularity within the verbal system.

‘good’ has become *bung* in the masculine except in fixed expressions (e.g., *bun de* ‘good day!’, *da bun humor* ‘of a good disposition’), and this final [ŋ] has been extended to the feminine *bunga*, again except for fixed expressions (e.g. *buna seira* ‘good afternoon/evening!’, *da buna fè* ‘in good faith’) where stem-final [n] is preserved.

These facts suggest a regularity of the Stem-level phonology⁴ by which a nasal following stressed [u] in a final syllable is obligatorily [ŋ]. That would account for all of the [n]/[ŋ] alternations in verbs with one exception, *splanar/splanga* ‘(to) plane’. This raises some interesting issues concerning the architecture of the grammar, however.

What we want to say is that the stressed and unstressed stems of a verb like *sclavunar/sclavunga* ‘clean the bottom of an oven’ have the same segmental form (/sklævun/), with the [ŋ] of the stressed stem following from the stress on final syllable [u]. Note what that implies, however. The stress on this stem must be present at a point where it is still possible to determine that the /un/ sequence is stem-final, because [n] is perfectly possible after a stressed [u] in the penultimate syllable of a word (cf. *stri-una* ‘sorceress’). This means either that (contrary to views of morphology such as that presented in Anderson 1992) information about morphological structure must be preserved after the addition of unstressed endings (e.g. [-ə] ‘3sg Pres. Indic.’), or else that the regularity affecting stem-final nasals after stressed /u/ must be enforced at a point prior to the selection of this stem for use in a specific word form. This latter possibility is of course perfectly consistent with the notion that the two stems of a verb are formed (including the assignment of metrical structure) at the Stem level, and then one or the other is chosen at the Word level in association with inflectional material added at that point. It is more difficult to reconcile with monolithic (i.e., non-level-ordered) versions of OT, however, or with a variety of rule-based models.

2.5 More Complex Alternation Patterns

Thus far, our consideration of the differences between the stressed and unstressed stems of alternating verbs has been limited to cases in which it is the last vowel of the stem (and/or the character of a nasal consonant following that vowel) that differs from one stem to the other. These are the cases that most directly have their explanation in the history of vowel reduction in Surmiran, but they are by no means the only types that are found.

A number of verbs show alternation in the penultimate vowel of the stem as well as (or in a few cases, instead of) the last vowel. Some of these are illustrated in (13).

⁴I assume here an architecture along the lines of Stratal Optimality Theory (cf. Kiparsky 2000, 2003 and elsewhere), with potentially distinct Root, Stem, Word and Post-Lexical phonologies each of which is represented by a system of constraints.

(13)	Alternation	Infinitive	3sg Pres. Indic.	gloss
	a-ə~o-e	<i>flammager</i>	<i>flommegia</i>	‘blaze’
	e-ə~ə-e	<i>deklarar</i>	<i>daclera</i>	‘declare’
	i-i~ə-e	<i>angivinar</i>	<i>angiavegna</i>	‘solve’
	i-i~ə-ej̃	<i>misirar</i>	<i>maseira</i>	‘measure’
	i-i~ə-i	<i>ghisignier</i>	<i>gassigna</i>	‘taunt’
	u-ə~ə-o	<i>murmagner</i>	<i>marmogna</i>	‘murmur’
	u-ə~ə-oj̃	<i>suarar</i>	<i>savoira</i>	‘smell’
	u-ə~ə-u	<i>ruschanar</i>	<i>raschunga</i>	‘speak’
	u-∅~ə-oũ	<i>luvrar</i>	<i>lavoura</i>	‘work’

These patterns are less common than those involving only the last vowel of the stem, but they exist nonetheless. Like the simpler alternations, they have their source in the complex history of reduced vowels in Surmiran, as detailed in the handbooks. For example, the verb *luvrar/lavoura* derives from the stem of LABORARE. In the stressed stem, the stress falls on the second vowel (o) which develops straightforwardly to [oũ], with the initial A becoming [ə]. In the unstressed stem, however, the first two syllables formed a single trochaic foot at some point, subordinated to the primary stress borne by the ending. Within such a foot, if the second vowel was [+Round] and the first was not, rounding was transferred to the first vowel. This change⁵ is reflected in a number of other words, such as the alternation in words like *ruschanar/raschunga* and *Suagnin*, a spoken form of the place name *Savognin* (whose official form has been remodeled from dialects in which this change did not take place). In the unstressed stem of ‘to work’ the second, reduced vowel of the initial foot was syncope, yielding *luvrar* as the infinitive. This and a number of similar changes are no longer part of the synchronic phonology of the language, but have left their traces in the stem alternations of (13).

A few verbs display an alternation that looks at first glance like a variety of metathesis. *Bargeir* ‘cry’, 3sg. Pres. Indic. *bragia*, *patartger/patratga* ‘think’, *sgartar/sgratta* ‘scratch’ and one or two others seem to display an *ar/ra* alternation between their unstressed and stressed stems. When we consider the verbs *crescher* [ˈkreʃər] ‘be brought up’, 1pl. Pres. Indic. *carschagn*, and *sgarmar* ‘remove the cream from milk’, 3sg. Pres. Indic. *sgroma*, however, this appears in a somewhat different light. Rather than metathesis, what we have in these verbs is an alternation between a vowel that appears in the stressed stem and ∅, with an epenthetic schwa inserted in the (otherwise vowel-less) unstressed stem: /zgrat/, /kreʃ/, /zgrom/ as stressed stems corresponding

⁵See Grisch 1939, pp. 93f. for discussion and further examples.

to unstressed /zgrt/, /krš/, /zgrm/ with schwas inserted before /r/ to give [zgərt], [kəřš] and [zgərm] as the surface forms of the stem. An alternation between [ə] and \emptyset before liquids occurs in other forms in the language; whether a unitary principle of epenthesis (or deletion) governs all of these cases remains to be established, but the claim of secondary nature for the [ə] (orthographic *a*) in the relevant verbs does not seem problematic.

The alternation between a full vowel in the stressed stem and \emptyset in the unstressed stem (with subsequent epenthesis of [ə] before /r/) of the verbs just discussed has precedent in another verb, *glisnarger* ‘simulate’, 3sg. Pres. Indic. *glisnaregia*, and possibly also in *cloccar/clocchegia* ‘gurgle’ and *tuslar/tuslegia* ‘spank, clobber’ (with simplification of the clusters /kj/ and /slj/ in the unstressed stems, rather than epenthesis).⁶

Finally, a ə/∅ alternation is also found, but in the opposite direction, in the verbs *sbusarar/sbusra* ‘go wrong’ and *sdaranar/sderna* ‘lay down’. Once again, a [ə] is found before /r/ in the unstressed stem, which may suggest a connection with verbs like *sgarmar/sgroma*. Neither alternation, however, seems purely a matter of the synchronic phonology of the language.

2.6 The Stem Suffix *-esch*

Thus far, we have established that a great many verbs have two distinct stems, distributed in accord with a rather straightforward principle: one stem appears in word forms involving an affix which itself bears the main word stress (e.g., the first and second person plural present indicative suffixes) while the other appears with affixes that do not themselves bear stress. The stem allomorphy here is clearly phonologically conditioned, rather than being governed by the morphological categories of the words in which one stem or the other appears. The question that naturally arises is whether the alternations we have seen are entirely matters of the phonology of Surmiran.

It is uncontroversial that these alternations are *historically* phonological in their origin: the principles governing the reduction of vowels in unstressed syllables have clearly played a central role, for one thing. But the survey of alternations that we have made in the preceding sections makes it much less likely that these historical processes could be motivated for the synchronic grammar of the language. We are thus led to the conclusion that the stem variation found in individual verbs is largely (if not entirely) a matter of lexical specification, with the lexical entry for each verb specifying not one single underlying stem form but two. One of these appears in words containing

⁶These may all be reflexes of verbs in -IDIARE; other verbs of that class (cf. Grisch 1939, p. 163) have vowel/ə alternations in the corresponding position instead of vowel/∅, as in *manager/manegia* ‘mean’ (stem from German *meinen*), (*sa*) *turpager/turpegia* ‘be ashamed’.

a stressed suffix and the other appears when the stress falls on the stem itself. This situation is of course familiar at least in part from many other Romance languages, but seems to be particularly robust in Surmiran (and Rumantsch more generally).

The conclusion that the stem variation we have seen cannot have its origin in the operation of independently motivated phonology is confirmed by another large (and productive) class of verbs. For these verbs, the stressed and unstressed stems differ not in terms of vowel alternations or the like, but rather in the presence (*vs.* absence) of a suffix *-esch* ([-ɛʃ]).

Consider the present indicative paradigm of the verb *luschardar* ([luʒər'dar]) 'strut' in (14) for example.

- (14)
- | | |
|-----|----------------|
| 1sg | luschardesch |
| 2sg | luschardeschas |
| 3sg | luschardescha |
| 1pl | luschardagn |
| 2pl | luschardez |
| 3pl | luschardeschan |

Here the unstressed stem /luʒərd/, which appears with the affixes *-agn* and *-ez* (as well as with all other stressed affixes in other tenses), is extended by the suffix *-esch* whenever stress would be expected fall on the stem. The basis of the variation between the presence *vs.* absence of *-esch* is exactly the same as in the paradigm of ordinary alternating verbs like (3), but here the possibility of a phonological regularity that inserts (or deletes) the sequence /ɛʃ/ does not exist.

A search of the Surmiran lexicon turns up a great many verbs whose paradigm is like (14). Newly borrowed verbs from other languages often tend to be assigned this pattern. A number of verbs that are listed in Sonder & Grisch 1970 with one or another of the patterns of alternation we have surveyed above are identified as *-esch* verbs in the later dictionary of Signorell (1999). When speakers cannot recall the correct alternation pattern for a given verb, they sometimes produce an *-esch* form instead.

The motivation for this productivity is clear. When stress is assigned to a stem ending in *-esch*, it falls on *-esch* itself, rather than on the lexical portion of the stem. In a paradigm like (14), the result is that this lexical portion of the stem is always unstressed, and thus displays no stressed/unstressed alternation. The use of this pattern, then, has the advantage that the speaker does not need to retrieve any information about the specific alternation pattern of the stem in order to produce all of the correct forms. Otherwise, it would be necessary to choose (for the 3sg Pres. Indic. form of *luschardar*, for example) among a variety of possibilities such as **luscharda*, **luscheirda*, **luschorda*,

**laschurda*, **laschorda*, etc. Each of these patterns is more or less secure with reference to at least some verbs in the Surmiran lexicon, but the availability of the paradigm in (14) makes it possible to avoid the choice when positive evidence is not readily available.

The correctness of this account is indirectly supported by the description for native speakers in the normative grammar of Signorell et al. 1987, pp. 72f.. After noting that “a number of verbs, almost all with the infinitive ending *-ar* or *-eir* [é]” show the paradigm in (14), and explicitly relating this to the phenomenon of alternating verbs, the authors go on to characterize its scope in negative terms. Essentially, the *-esch* form is avoided when the correct alternation pattern is known. Otherwise, however, a potentially alternating verb can be treated in this way.

The full scope of usage of the verbal paradigm based on a stressed stem consisting of the unstressed stem extended by *-esch* is not clear, though it is apparent that it is quite robust. Since the principles governing the distribution of the two stems remain the same as those governing (other) alternating verbs, and the presence *vs.* absence of *-esch* itself cannot be due to the operation of a purely phonological rule, this supports the claim that the stem alternation pattern in general is a matter of phonologically conditioned suppletion in the sense of Carstairs (1988), not simply phonology.

2.7 Alternations in Other Word Classes

Up to this point, we have described the stress-based alternation patterns in Surmiran as a fact about the verbal system. Closer inspection, however, reveals the fact that these patterns are not at all limited in that way. Apart from their role in verbal inflection, similar stem alternations appear in derivationally related forms as illustrated in (15).

(15)	e _i ~ə	neiv	‘snow’	navada	‘much snow’
	e _i ~i	stgeir	‘dark (adj.)’	stgirantar	‘get dark’
	ou~u	pour	‘farmer’	puraglia	‘peasantry’
	o~u	fora	‘opening’	furela	‘entrance’
	e~i	fem	‘smoke’	fimera	‘dense smoke’

Typically, when a verb has “stressed” and “unstressed” stems, derivationally related forms will be built on one or the other, depending on where stress falls in the derived form as illustrated in (16).

- (16) ludar/loda ‘to praise’:
 (igl) lod ‘praise (n.)’ ludevel ‘praiseworthy’
 clamar/cloma ‘to call’:
 (igl) clom ‘call (n.)’ (la) clamada ‘calling (n.)’
 gartager/gartegia ‘to succeed’:
 (igl) gartetg ‘success’ malgartagea ‘ill brought up’
 stimar/stema ‘attend to, value’:
 (la) stema ‘worth’ (la) stimadeira ‘valuation’

But in a significant number of forms, illustrated in (17), the “stressed” stem appears in a form where it does not take the stress.

- (17) 'sfend[ər]/sfandagn ‘(to) split’:
 sfandia ‘cracked (adj)’ sfendibel ‘splittable’
 durmeir/dorma ‘(to) sleep’:
 durmigliun ‘late riser’ dormulent ‘sleepy’
 satger/setga ‘(to) dry [intr.]’:
 setg ‘dry (adj.)’ setgantar ‘(to) dry [trans.]’
 accumadar/accumoda ‘adjust’:
 accumulabel ‘adjustable’ accumuladaint ‘adjustment’
 accumpagner/accumpogna ‘accompany’:
 accumpagner ‘accompanist’ accumpognaint ‘accompaniment’

These may result from cyclic application, with stem choice taking place on one cycle and further morphology (and alteration of stress pattern) taking place on a later cycle (cf. Kamprath 1987 for discussion of motivations for cyclic interaction in a closely related form of Rumantsch, the language spoken in Bergün/Bravuogn). Further exploration of the Lexical Phonology of the language is necessary before this suggestion can be considered confirmed.

There is one major difference between the alternations in verbal inflection and what we find in other categories. In particular, the “stressed” stem in *-esch* never shows up outside of verbal inflection. Verbs that take *-esch* in the stem-stressed forms always use the “unstressed” stem as the base for derivation (e.g., *fixar/fixescha* ‘fix, harden’; *fix* ‘fast, unmovable’, *fixaziun* ‘fixation’). Evidently the appearance of *-esch* as a way of avoiding stem alternation is a fact about verbs (or about the rules of verbal inflection) and not a fact about the more abstract stems of those verbs.

2.8 An Excursus on a Defective Paradigm

Before concluding the discussion of stem alternations, it is interesting to consider the facts concerning the verb *dueir* ‘must, should’. This is a classic example of a “defective” paradigm: in the Present Indicative, only two forms exist: 1pl. *duagn*, and 2pl. *duez*. All of the singular forms and the third person plural are replaced by forms of a different verb, *stueir*. This verb is itself suppletive: *ia stò* ‘I must’, *te stost* ‘you (sg.) must’, *el stò* ‘he must’, *els ston* ‘they must’; Subjunctive *ia stoptga*, etc. In addition to these missing forms of the Present Indicative, the Subjunctive of *dueir* is also missing, and replaced by forms of *stueir*. Other verbal forms are built normally, however: Imperfect (*ia dueva*, etc.), Conditional (*ia duess*, etc.), Future (*ia duaro*, etc.); Gerund (*duond*), Past Participle (*duia*, *dueida*).

The pattern of defectiveness displayed by *dueir* is not at all arbitrary or random, of course. The evident generalization is that all and only those forms built on the “unstressed” stem exist, and these are constructed in completely regular fashion. Where the “stressed” stem would be called for, the form in question is substituted by one taken from the paradigm of *stueir*. The history that has led to this state of affairs is fairly complex, involving not only phonological developments but also semantic competition between the reflexes of DEBERE and STOPÈRE (cf. Decurtins 1958, pp. 155ff. for discussion), but the synchronic situation is quite stable.

It would seem that this defective paradigm could easily be repaired: even if no inherited “stressed” stem exists, surely there are other, phonologically similar verbs that could serve as the model for the creation of one. But in fact, all other verbs of the shape C_0ueir are either substantially irregular (like *stueir* ‘must, should’) or use the stem extension *-esch* in the stem-stressed forms (e.g. *cueir* ‘allow’; *flueir* ‘flow’; *prueir* ‘sprout’, *scueir* ‘begrudge’, (*sa*) *snueir* ‘shudder’). As a result, there is no available model to provide a stressed stem.

The alternative, of course, would be to use the stem extension *-esch* for the forms in question, giving e.g. **ia duesch* ‘I must’. This is quite ungrammatical, however. One possible explanation is that *dueir* is unlike most verbs in being a modal auxiliary, rather than a ‘normal’ lexical verb, and no other modal or other auxiliary verbs use *-esch* in their conjugation. Since the inflectional properties of modal and other auxiliary verbs in Surmiran (as opposed, say, to English) are otherwise identical with those of lexical verbs (*modulo* individual irregularities of formation and suppletion), though, it is not clear how this proposal could be implemented.

Recall the generalization from Signorell et al. 1987, p. 72, to the effect that verbs taking *-esch* are in general those with infinitives ending in [-ar] or [-eɪr]. The infinitive of *dueir*, in contrast, ends in [-eɪr̥], and so this verb does not belong to the class for

which insertion of *-esch* is normal. Formalizing this observation requires us to limit the appearance of *-esch* to verbs from two out of the six conjugation types. Apart from the possibility of extension by *-esch* these two conjugations have no specific properties in common, and so it is not clear how to express this fact.

The essential observation concerning *dueir* is clear, however. This verb is defective in having no “stressed” stem, and no valid model on which one can be constructed.

2.9 Conclusions: The Descriptive Properties of Alternating Stems

We conclude, therefore, that Surmiran shows a rich system of phonologically conditioned allomorphy, where the conditions governing the use of one allomorph or the other (but not the actual difference in shape) are a matter of the phonological environment in which the stem appears: specifically, the pattern of stress distribution associated with its affixes.

For the vast majority of bases in the language (except those taking the extension *-esch*, and *dueir*), at least two distinct stems must be given in the lexicon, with the choice based on the location of main stress in a given inflected form.⁷ Of course, this does not at all entail that the relation between the stems of a given base is entirely unstructured. In Surmiran as in other languages, the lexicon is not simply a list of forms, but also includes a set of regularities (cf. Jackendoff 1975, Anderson 1992, Anderson & Lightfoot 2002) that identify some lexical patterns as ‘regular’ and well integrated into the language and others as arbitrary and isolated.⁸ Nonetheless, from the point of view of the morphology and phonology of the language, Surmiran bases show two distinct stems whose distribution must be accounted for. It is to this that we turn next.

3 The Analysis of Stem Alternation

ALTHOUGH THE STEM ALTERNATIONS IN SURMIRAN (and other Rumantsch languages) have their origin in strictly phonological processes, those have become opaque,

⁷The analysis proposed here is reminiscent of that proposed for Italian by Vogel (1993), although Vogel proposed that the choice between two listed stems for a given Italian verb was to be stipulated in individual morphological rules, rather than projected from phonological conditions. At the time Vogel’s analysis was presented, tools such as those provided by Optimality Theory for the description of phonologically conditioned allomorphy did not exist, and it would be interesting (though beyond the scope of the present paper) to revisit the Italian facts with a view to reformulating her account in terms similar to those here.

⁸A similar point is made by Cameron-Faulkner & Carstairs-McCarthy (2000, pp. 83of.).

and are now lost as phonological rules. The residual allomorphy, however, is governed by a strictly phonological condition: one stem or the other is chosen depending on the location of main stress in the output form.

The resulting system displays a number of unusual properties when compared with other examples of phonologically conditioned allomorphy that have figured in the literature. For one thing, it is difficult to consider this to be a marginal pattern within the language: unlike the most widely cited instances of phonologically conditioned allomorphy, this pattern affects most content words in the language, and not just a small set such as a few affixes, or the ‘mobile diphthongs’ of Italian (van der Veer & Booij to appear).

The correct analysis of these alternations is not self-evident, and poses a problem for some approaches that have been adopted in other cases. Since it is stems, not affixes that alternate in Surmiran, a sub-categorization solution of the sort advocated by Paster (to appear) and Bye (2007, to appear) among others does not seem appropriate.

On the other hand, an approach that provides two phonological representations for each stem, and treats the choice between them as purely a matter of optimization based on phonological conditions (as in Kager 2007, Rubach & Booij 2001) could have trouble with the fact that the choice of the ‘wrong’ stem would apparently result in a perfectly well-formed word in many cases. Consider the verb *vurdar* ‘watch’, 3sg *varda* for example. If we simply listed the two stems as /vurd/ and /vard/, a constraint system would not appear to have any basis for preferring /vard/ to /vurd/ when stress falls on the stem, or for the opposite preference when stress falls on the desinence. Even supplementing the phonological constraints with a stipulated ranking of alternants (as in Bonet, Lloret & Mascaró 2007, Wolf to appear), the same issue will pose problems. Finally, conventional OT solutions will have to deal with the fact that the defectiveness of *dueir* appears to consist in its having only one stem (the unstressed one). The fact that when stress falls on this stem the resulting form is excluded is just the kind of phenomenon that ranked, violable constraints are not equipped to express.

3.1 Alternating Verbs

Apparently, then, the analysis of stem alternations in Surmiran will require some additional assumptions. The overall OT framework of work such as Kager 2007 and Rubach & Booij 2001 seems to point in the right direction, but what is required is some way to characterize individual stem shapes in such a way that they will correctly be preferred in stressed *vs.* unstressed environments.

One way to achieve this would be to represent the stressed stems as already bearing metrical structure, in the form of a monosyllabic (trochaic) foot constructed over the

final syllable of the stem. The unstressed stem, in contrast, would carry no metrical structure in its lexical representation. This marking would be supplemented by a stipulated preference for using the stressed stem if possible, and high ranking Faithfulness constraints requiring that input metrical structure be preserved. As a consequence, when an ending that itself attracts stress (such as the 1pl or 2p Present Indicative) is combined with a base, the preferred stressed stem is tried first. The lexical stress in this form could be considered to violate a constraint against a clash with the stress of the ending; and rather than fail to realize the lexical stress (violating Faithfulness), the form would then be constructed on the basis of the unstressed stem instead.

Although this solution has only been sketched, it seems clear that it is not ideal. The notion of “Stress clash” that must be appealed to is not self-evident, since a desinential stress may not be strictly adjacent to the stem (in e.g. *vurd-a'ro*, **vard-a'ro* ‘I will watch’), and some additional mechanism would be required to prevent the simple reduction of the lexical stress on the stressed stem /'vard/ from primary to secondary. In addition, the presence of lexical stress on these stems would obscure the distinction between genuinely unpredictable stress (in loan words, primarily) and stress which surfaces exactly when it conforms to the general principles of metrical structure in the language.

An alternative is suggested by the observation above in section 1 that in at least some instances, the vowels of unstressed syllables must be represented differently from those of stressed syllables. We have seen that the infinitive ending *-er* of the fifth class of verbs in Figure 1 must be represented as /ə/ as opposed to the /a/ of the first class or the /e/ of the second. Let us assume that this difference can also appear in stem forms. Now suppose that for a verb like /[ə]var ‘get up’, 3sg *leva*, we represent the unstressed stem as /ləv/ and the stressed stem as /lev/. We could now say that constraints militate against the appearance of the reduced vowel [ə] in stressed syllables, and conversely, against the appearance of a “full” vowel like [e] in unstressed syllables.

Suppose now we construct a verbal form from this base, where two stems are potentially available. If the form involves an ending such as that of the 1pl form /[ə]vagn, stress falls on the final syllable and the stem vowel is unstressed. As a result, the constraint system will prefer the stem /ləv/, whose vowel is acceptable in an unstressed syllable, to the stem form /lev/ which would have a full vowel in unstressed position. With an ending such as the [-ə] of the 3sg form *leva*, in contrast, the stress falls on the stem vowel, and so a stem with a full vowel in this position will be preferred to one with the reduced vowel [ə].

The same solution is readily extended to the other verbs of the “alternating” type. We can note that in every one of these, the last vowel in the unstressed stem is either *a* ([ə]), *i* or *u*. Just as unstressed *a* (sometimes also written *e*) is phonetically distinct in

quality from stressed *a*, the unstressed forms of *i* and *u* are laxer and shorter than the stressed forms. Suppose, then, that we allow these lax vowels /ɪ/ and /ʊ/ to appear in the lexical representations of stems, and extend the constraints referred to above so that not only [ə] but also [ɪ] and [ʊ] are preferred in unstressed syllables and dispreferred in stressed ones. We can now extend the treatment of *lavar/leva* to *durmeir* ‘sleep’, 3sg *dorma* and *fittar* ‘finish’, 3sg *fetta* by representing the stems of the former as {/dʊrm/, /dorm/} and of the latter as {/fɪt/, /fet/}. The choice of the correct stem will then be made on the basis of a preference for stress to occur on an appropriate (full) vowel, and not on an inappropriate one ([ə, ɪ, ʊ]).

In fact, all of the verbs of the ‘Alternating’ class can be accommodated by this analysis. Each will be assigned a lexical representation with two stems, differing as required in vocalism and in some cases (as discussed in earlier sections) in other ways as well. The crucial difference, however, lies in the character of the last (possibly the only) vowel of the stem: if this is one of [ə, ɪ, ʊ], the corresponding form will be preferred where stress does not fall on it (and dispreferred if stressed), while if it is a full vowel the preference will work in the opposite direction.

There is one additional circumstance where the analysis developed to this point does not fully resolve the choice of stems, and for which additional assumptions are necessary. Consider a verb such as *sutarar/sutera* ‘bury’. The stressed stem listed for this verb would be /sʊtər/ and the unstressed stem /sutər/. Now consider the 1sg present indicative of this verb, the only form whose construction involves no overt ending. Given the stress rules of the language, either stem would result in a well-formed word: [sʊ'tər] if stress is assigned finally, or ['sutər] with penultimate stress. In fact, it is the first of these alternatives that is correct, so we must provide some basis for the choice of final over penultimate stress.

We might simply say that, *ceteris paribus*, the stressed stem takes precedence over the unstressed when both are possible, along the general lines of analyses such as Bonet et al. 2007. This seems incorrectly stipulative, however, since it is quite general that words of this type (disyllabic stems with unstressed stem ending in /ə/ followed by *r*, *l*, *n* or *s*) — the only ones in which either syllable could bear main stress — behave in this way. It also seems implausible in general terms to invoke a preference for monosyllabic trochees over disyllabic ones. A third alternative, however, is to appeal to a constraint preferring main word stress to appear at the right edge, as in (18).

- (18) **Rightmost:** The primary stressed syllable is at the right edge of the Prosodic Word.

We need to say in any event that the rightmost foot in the word carries main word stress. The constraint (18) is outranked by others specifying the form of feet and the

relation between stress and vowel quality, and thus minimally violated whenever a word-final syllable is weak and thus necessarily unstressed; but it emerges unviolated to play a role precisely where other constraints do not force a choice between two stems, as in (*ia*) *suter* ‘I bury’.

3.2 ‘Regular’ and ‘Irregular’ Verbs

What, then, of the “regular” verbs that appear to show no alternation? These are verbs such as *cantar* ‘sing’, 3sg *canta*; *chintar* ‘calculate’, 3sg *chinta*; *cuntschier* ‘tinker’, 3sg. *cuntscha*. All such verbs have a stem whose last vowel is *a*, *i* or *u*, and it is straightforward to assimilate them to the (somewhat larger) “alternating” class. These verbs also have two stem forms, but the difference between them is concealed by the orthography: on the present analysis, the bases of ‘sing’, ‘calculate’ and ‘tinker’ each have a pair of shapes: {/kənt/, /kant/}; {/kɪnt/, /kint/}; and {/kʊnč/, /kunč/}, respectively. Again, the correct choice is made by the constraints that associate full vowels with stressed syllables and reduced vowels with unstressed ones.

It may seem counter-intuitive to assign two lexical stems to these verbs, where the only difference is one that seems to follow from phonetic vowel reduction. Recall, however, that in the course of history the relation between reduced and unreduced vowels has become increasingly opaque, and no longer the province of a productive phonological rule. The patterns [a]/[ə], [i]/[ɪ] and [u]/[ʊ] are just very common instances of a relation between stressed and unstressed vowels that is much more general than this basic set.

The pattern of two lexical forms for verbal stems, then, is quite pervasive in Surmiran. It can even be discerned under the complexity of many of the ‘irregular’ verbs of the language, which take idiosyncratic shapes for some cells of their paradigm. Consider the verb *pudeir* ‘can, be able to’, whose Present Indicative is given in (19).

- (19) 1sg *ia* poss
 2sg *te* post
 3sg *el* pò
 1pl *nous* pudagn
 2pl *vous* pudez
 3pl *els* pon

When we look at other forms of this verb, we find that the Present Subjunctive, normally built on the stressed stem, has a regular paradigm (*ia* *poss*, *te* *possas*, *el* *poss*; *nous* *possan*, *vous* *possas*, *els* *possan* if we take the stem to be /pəs/. Forms like the Imperfect (*ia* *pudeva*, etc.), Conditional (*ia* *pudess*, etc.), Future (*ia* *pudaro*, etc.) and others

that are normally built on the unstressed stem are similarly regular on the assumption that this is /pud/. For this verb, then, we need only list the 2sg, 3sg and 3pl Present Indicative forms (/pɔst/, /pɔ/, /pɔn/) in addition to the stem pair {/pɔs/, /pud/}.⁹ A number of verbs have idiosyncratic forms in the Present Indicative singular and 3pl; some have idiosyncratic stems in the Subjunctive (e.g., *savoir* ‘know’, Subjunctive *ia sapɔga*, with the same stem appearing in the Imperative) or some other category, but the basic outline of the two-stem system can be found in all except perhaps the most irregular of verbs (*esser* ‘be’ and *aveir* ‘have’).

3.3 Verbs in *-esch*

Does this mean that *every* verb in the Surmiran lexicon has two associated phonological shapes for its stem (together, perhaps, with some additional idiosyncratic forms)? If only a single stem were present, that would imply that the verb stem did not alternate at all — not even between [a] and [ə], [i] and [ɪ], or [u] and [ʊ], which could only happen if there were no difference between stem-stressed and unstressed forms. That is in fact just what we saw for a large class of verbs, those that take the stem extension *-esch* exactly in the forms that would otherwise have stem stress. These verbs only have unstressed forms (ignoring the stress that falls on *-esch* itself), and so require only a single stem.

As noted above, the extension *-esch* only appears in verbal inflection. If these verbs were listed with two stems (with and without *-esch*), that would suggest that any related de-verbal forms with stem stress might also show the extension, which does not happen. We need to say, then, that this is specific to verbal inflection, introduced by a rule such as (20).¹⁰

$$(20) /X/ \longrightarrow /X\varepsilon\check{s}/ \left[+\overline{\text{VERB}} \right]$$

The place of this rule within the system of constraints requires some explanation. Since it expresses no property (Morphosyntactic or otherwise) of the verb, its application is not required by any constraint of the **Max** family (requiring that input material have some correspondent in the output). And since the phonological material it introduces is not present in the input, constraints of the **Dep** family will be violated when it applies. We might expect, then, this rule could never actually affect the output, unless this eliminated violations of some other constraint(s). And in fact, it will

⁹Note that the 1sg Present Indicative *poss* is completely regular on this assumption.

¹⁰Whatever restriction is necessary to limit the applicability of this rule to verbs of the [-ar] and [-ejr] classes, as noted above in sections 2.6 and 2.8, is omitted in this formulation.

have that effect exactly when a verb appears in a form with stem stress, but only has an unstressed stem. In exactly that case, the constraint against stress falling on one of the vowels [ə, ɪ, ʊ] would be violated, something that is prevented by the introduction of *-esch*. A verb that has a stressed as well as an unstressed stem has an alternative way of avoiding this violation, so *-esch* will never show up in the paradigm of such a verb. Stating a specific constraint ranking that would have this effect would require more precision with respect to the relevant constraints than is presently available, but the outline of the analysis proposed should be clear.

Verbs for which no inherited alternation is motivated, or where the actual alternation is forgotten or insecure, can thus be represented with only a single (unstressed) stem, and the result will be that these (and only these) will show the extension *-esch* exactly in their stem-stressed forms.

3.4 *Dueir*

We are still left with the problem of the defective verb *dueir* ‘should, must’. This verb, it will be recalled, lacks precisely those forms where stem stress would be required, and replaces these with forms of another virtually synonymous verb, *stueir*. Note that it will not suffice to say simply that *dueir* ‘borrows’ a stressed stem from *stueir* to produce a suppletive (rather than defective) paradigm, comparable to that of a verb like *neir* ‘come’, whose unstressed stem, simply /n-/, is paired with the stressed form /vijɪ/. This is implausible because it is not just a single stem, but the full range of irregular forms of *stueir* (*ia stò, te stost, el stò, els ston*; Subjunctive *ia stoptga*, etc.) that replaces those of *dueir* where stress would fall on the stem. Suppletive paradigms resulting from the merger of originally independent verbs certainly occur, as discussed by Maiden 2004, but this seems unappealing for *dueir*, given that *stueir* retains its status as an independent verb with a full paradigm, some of whose forms are “borrowed” when forms of the semantically similar verb *dueir* are unavailable.

All forms built on the unstressed stem of *dueir* are essentially regular, and these are the only ones that exist for this verb. This suggests that the verb has only a single stem, the unstressed one (/dʊ/); from what was said in the preceding section, that might appear to entail that the stem-stressed forms, rather than being lacking, could be built with an extended stem */dʊɛʃ/. As noted in section 2.8, that is not in fact possible.

These circumstances present a difficulty for the present analysis based on choice of stem through ranked violable constraints. In the absence of a stressed stem for *dueir*, and given the inapplicability of (20) to the stem /dʊ/, we would expect the unstressed stem, as the only one available, to show up exceptionally as the base for the relevant

stem-stressed forms. But that is not what happens: the stem-stressed forms are simply missing, not phonologically anomalous. Optimality Theory is well equipped to allow for the emergence of unexpected forms, but not at all set up to describe cases in which constraint violation leads to complete ungrammaticality.

Of course, the result is not in fact complete ungrammaticality, but rather the substitution of forms from the paradigm of another (essentially synonymous) verb for the problematic ones. This implies that some constraint(s) relevant to faithful lexicalization must in fact be integrated with the phonology, such that a phonological violation (in this case, having stress fall on a stem vowel that can only be unstressed) is repaired by choosing a different lexical item altogether. This suggestion has interesting implications for the overall architecture of grammar, and for the theory of defective paradigms in particular, but it is impossible to develop it further here.

4 Conclusions

PHONOLOGISTS TYPICALLY ASSUME that variation in the shape of individual lexical items is either governed by purely phonological rules or essentially arbitrary, and correlated with morphological categories. Surmiran, in contrast, makes extensive use of variation that cannot be reduced to regularities of sound structure alone, but which is still correlated with phonological rather than morphological factors.

If the analysis offered in this paper is on the right track, Surmiran (and the other Rumantsch languages for which much the same account could be offered) underwent major restructuring in the evolution from earlier Romance. The changes in question were not dramatic remodelings of the surface forms of words, but a much subtler change in the organization and status of inter-word relations. An original productive rule reducing vowels in unstressed syllables, something found in most languages with dynamic stress, became increasingly opaque through a combination of developments in individual words, other phonological processes, and borrowings from other languages (and from other forms of Rumantsch). Alternations between the shapes of stems that were originally predictable from the location of stress were largely preserved, but came to be predictable only by taking the identities of individual words into account — that is to say, lexicalized. The result is a system in which phonologically conditioned but lexically specified allomorphy, widely considered a rather marginal phenomenon in the languages of the world, has come to dominate most of the phonological variation in the language. As such, Surmiran serves as an interesting example for the phonologist or morphologist of how readily and completely a language can abandon the sort of simple and coherent internal organization (based on

unitary lexical items and purely phonological variation) that we often assume as the ideal of linguistic structure.

The original phonological processes that gave rise to this situation (especially vowel reduction) still have a role to play in the description of Surmiran, but it is no longer that of phonological rules of the usual sort. Instead, these now have the status of regularities governing the internal structure of the lexicon. The two stems associated with a verb are not, in general, related arbitrarily in form, but instead fall into one or another of a limited set of patterns described by analogs of the original phonological rules. The lexicon is not, as often portrayed, simply an inert list of isolated forms, but instead a system of knowledge that forms part of a speaker's overall competence in the language (cf. Anderson & Lightfoot 2002, chap. 7). In order to capture the regularities that undeniably characterize the relations between stem shapes in Surmiran, linguists need to take more seriously the kind of observations made many years ago by Jackendoff (1975), and develop a more articulated theory of that knowledge than exists today.

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