Frisian Phonology

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Chapter 1

Introduction

Frisian is a North Sea Germanic language closely related to modern Dutch, although it's history is intimately tied to that of English. Old Frisian was one of the closest relatives to Old English. Like English and other Germanic languages, Frisian allows for a large variety of consonant clusters in syllable onsets, especially word initially. I will detail Frisian onsets in chapter 4. Frisian has a large vowel inventory with 18 monophthongs and at least 17 diphthongs. Frisian vowels can be nasalized when an (immediately) following nasal has been deleted. There is also a process known as "breaking" (Gr. *Brechung*) in Frisian where rising and falling diphthongs alternate. The source for this alternation seems to be the synchronic reflex of historic shortening of the falling diphthongs in certain contexts[1]. Chapter 2 deals with the vowel system of Frisian. The consonant inventory of Frisian is relatively conservative (contrasted both with its large vowel inventory and the larger consonant inventories of neighboring and closely related languages); it is treated in chapter 3.

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[1]de Haan (2001) p. 37.

Chapter 2

Vowels

Hoekstra (2001) lists nine long vowels and nine short vowels plus schwa. The long vowel [eː] alternates with the short vowel [ɪ] in both shortening and lengthening contexts. This is reflects, I think, a cross-linguistic dispreference for (front) tense mid-vowels in shortening contexts (e.g., Spanish [e] → [ɛ] in closed syllables, in which long vowels would form illegal, super-heavy syllables). Additionally, he lists several centering and falling diphthongs. He claims that Frisian has no rising diphthongs; the first vowel of a "broken" syllable is a part of the onset under this view. Visser (1997) pp. 201–215 provides a substantial discussion of nuclear/onset constituency and contrasts Hoekstra's analysis with the hypothesis that rising diphthongs are vowel-vowel sequences. Visser concludes with an argument for the latter choice, based primarily on the fact that rising diphthongs have the same behavior as triphthongs with the same two final elements. This follows for him because he assumes that the nucleus of a triphthong (and therefore the nucleus of an identically-behaving rising diphthong) must contain two vowels; an onset could not contain two semi-vowels, presumably for reasons of sonority sequencing, although he does not state this explicitly. What Visser does not consider is the possibility that a triphthong is a sequence of a glide followed by a vowel followed by a (coda) glide. In fact, he discounts the possibility of coda glides completely in Frisian.

(2.1) /i(ː)/   /y(ː)/   /u(ː)/
       /ɪ/ ∼ /eː/   /ø(ː)/   /o(ː)/
       /ɛ(ː)/   —   /ɔ(ː)/
                     /a(ː)/

(2.2) **Non-centering diphthongs** i(ː)u, yu, ɔu, øy, ui, oi, oːi, ɛi, ai, aːi
       Centering diphthongs iə, yə, uə, ɪə, øə, oə

2.1   Vowel Nasalization

In Frisian the sequence of a vowel and a nasal—the coronal nasal in particular, but [m] and
[ŋ] also participate in some derivations—is made into a nasalized vowel when the following
(consonantal) segment is [+continuant][1]. This is a nicely opaque process; the generalization
that vowels are nasalized when they occur before a nasal segment that has been deleted is
not surface apparent.

(2.3)   in 'in' ∼ [ĩsojx] 'insight'
         v'in 'win' ∼ [(du) v'ĩst] '(you) win'

The process of vowel nasalization is interesting because vowels in Frisian are not usually
noticeably nasalized be'fore nasal stops. If we assume that this is a deletion process, it
becomes very hard to describe in an optimality theoretic way. Any explanation of these
facts using output-output correspondence is problematic because in all the outputs where
the vowel is not deleted, the vowel is oral. There could be a correspondence constraint like
that in (2.4), but that seems very strange to me. Things do not work out well in sympathy
theory, either. We know that Frisian prefers that vowels remain oral when they precede nasal
consonants, so the constraint against changing nasality is ranked higher than the constraint
against oral vowels preceding nasals, as shown in 2.5. If we incorporate that ranking into
a sympathy analysis, we end up with the tableau in 2.6, which appears alright except that
no constraint can be the selector constraint. If the selector constraint were **Max[n]**, then

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[1]Hoekstra (2001) p. 85.

the sympathetic candidate would be (a)—it violates the lower ranked constraint against oral vowel preceding nasals (i.e., ***V̌n**); if the selector constrain were ***V̌n**, the sympathetic candidate would be *[is]. A similar argument eliminates the possibility of using a targeted constraint like **Prefer Ṽ to V / ___[+nas]**: it would have to be dominated by a constraint against changing nasality (to yield [in]), and would never get a chance to influence the harmonic ordering relation among the candidates.

(2.4) **Base-Output Nasal Preservation (PresNas-BO)**: if a vowel X in the output corresponds to a vowel X' in the base form and X' is followed by a nasal stop and X is not, asses one violation if X is not nasalized.

(2.5) /in/ → [in] 'in'

Input: /in/	ID[Nas]	Max[n]	*V̌n
a. ĩn	*!		
b. i		*!	
c. ☞in			*

ID[Nas],Max[n] ≫ *V̌n

(2.6) hypothetical /ins/ → [ĩs]

Input: (hyp) /ins/	*ns^2	ID❀O[Nas]	Max[n]	ID[Nas]	*V̌n
a. ins	*!	*			*
b. ❀ĩns	*!			*	
c. is		*!	*		
d. ☞ĩs			*	*	

*ns ≫ Max[n]; ID❀O[Nas] ≫ ID[Nas]

I take these failures to be good evidence that the nasal is not deleted. In section 4.2.4, I develop a theory of possible onset clusters using coalescence. I think that this can make use of that same machinery. The nasal and the vowel coalesce to save a violation of ***ns**, as shown by the tableau in (2.7).

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[2]this is the constraint that militates against a nasal followed by a continuant consonant

(2.7) hypothetical /ins/ → [ĩs]

Input: /iₙₐsₖ/		*ns	Uniformity
a.	iₙₐsₖ	*!	
b.	☞ĩ₍ᵢ,ⱼ₎sₖ		*

*ns ≫ Uniformity

2.2   Shortening and Breaking

Stems with a long vowel often have a variant, shortened form that appears with a suffix or when the stem is the first constituent of a compound word. When the vowel is one of the centering diphthongs listed in (2.2), then it may also be "broken"—that is, the vowel may be mutated into one of the "broken" (or rising) diphthongs. The correspondences are [iə]~[jɪ], [ɪə]~[jɛ], [uə]~[wo], and [oə]~[wa][3]. The exact conditions for the rule are unclear and the process is at least opaque if not completely unproductive; there exist some pairs of homophonous stems, one member of which has a broken allomorph while the other one does not; for instance [fɪər] 'feather' has the plural form [fjɛrən], while [fɪər] 'ferry' has the plural form [fɪərən].[4]

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[3]Hoekstra (2001) p. 87.
[4]Ibid. p. 88.

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Chapter 3

Consonants

(3.1)

	Labial	Coronal	Dorsal
Plosive	/p/ /b/ (/v'/)	/t/ /d/	/k/ /g/
Fricative	/f/ /**v**/	/s/ /**z**/	/**x**/ [**ɣ**]
Nasal	/m/	/n/	[**ŋ**]
Lateral Approx		/l/	
Central Approx		/r/	

3.1 /**v'**/

The phone [v'] is a strange segment described as being "intermediate between a fricative and a plosive."[1] It is likely that [v'] is an allophone of /v/, as /v'/ appears only in word-initial position, where [v] (along with all other voiced fricatives) is not allowed. It is somewhat problematic, however, as [ʋ] also appears exclusively in this position and might be a better candidate for the allophone of /v/. An additional confound is that v-initial loan words are adopted with initial [f].

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[1]for a discussion see Visser (1997) p. 58.

3.2 [r] and [d]

The are several ways in which [r] and [d] interact and alternate. The comparative and agentive suffix /ər/ is realized by the allomorph –dər when the stem ends with [r]. Hoekstra interprets this as a ban on the sequence [rər] and considers the [d]-epenthesis to be the repair. [d]-epenthesis can optionally break up the sequences [nər] and [lər]. Additionally, intervocalic [d] varies freely with [r], with [d] being the historic pronunciation and the current trend being an increasing selection of [r]. Finally, [r] is deleted when it occurs before [d] or any other "alveodental" consonant[2].

The nature of the /r/ phoneme is certainly relevant to any treatment of these facts, but the literature is quite vague on this point. Visser (1997) p. 39 states only that it is a liquid and a continuant. It patterns closely with other coronal segments, so I have assumed that it corresponds to IPA [ɹ]. Århammar (2001) p. 347 reports that, at least in Helgoland, the traditional Frisian /r/ is being replaced with the "uvular r," presumably [ʁ], but does not describe the sound being replaced.

3.2.1 [d] Epenthesis

(3.2) /sur+ər/ → [sur.dər] 'sourer'

Some insight on this pattern of [d] epenthesis in (3.2) can be gained from the observation that the sequence of a schwa followed by sonorant consonant often varies freely with a syllabic sonorant consonant.[3] There is free variation, for example, between [han.dəl] and [han.dl̩] 'trade, business.' This tendency is especially strong for /ər/, and in some dialects the creation of a syllabic r in this context is obligatory. This means that an underlying sequence /rər/ could have a surface representation [rr̩] ([...r.dr̩] with epenthesis). The unepenthesized form is potentially a violation of the Sonority Sequencing Principle; its nucleus is perhaps

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[2]Hoekstra (2001) p. 87.
[3]Visser (1997) p. 319, citing Rubach.

not (enough) more sonorous than its onset. The epenthesis is well motivated to the extent that the creation of a syllabic [r] is obligatory.

They are several factors involved here. Like other many Germanic dialects, I suspect that most Frisian dialects have a coda allophone of /r/ that is different from any of the possible onset allophones. In Swabian German, for example, one finds IPA [r] and [ʁ] freely varying in the onset position while [ɐ] is the only possibility for /r/ in codas. Unfortunately, the Frisian references available do not give phonetic transcriptions in their discussions of the phonology. It would be particularly useful to know what the phonetic difference between /r̩/ and /ər/ is. From my knowledge of "East Frisian" (the dialect of the non-Frisian Germanic inhabitants of the area formerly known as East Friesland) that coda /r/ in Frisian is quite vocalic; it is certainly an areal feature. The combination of schwa and /r/ could be something a lot like schwar (IPA [ɚ]). The constraint against [rɚ] might be formulated as an OCP constraint against successive specifications for rhotacism.

The table in (3.3) shows some possible optimizations under the various assumptions that can be made about the /r/ phoneme in Frisian. Candidates (a) and (b) demonstrate the sonority based approach when the schwa is not part of the underlying representation of the agentive/comparative morpheme as is assumed by Rubach (quoted by Visser). If the schwa is part of the underlying representation, then additional constraints are needed, as demonstrated by candidates (c) and (d). Candidates (e), (f), and (g) combine the sonority-based approach with the hypothesis that /ər/ is obligatorily realized as [r̩]. Finally, (h) and (i) demonstrate the rhotacism sequencing approach.

(3.3) /sur+(ə)r/ → [sur.dər]

Input: /sur+r/	SONSEQ	DEP[d]
a. su.rr̩	*!	
b. ☞ sur.dər		*

Input: /sur+ər/	SONSEQ	DEP[d]
c. 👁 su.rər		
d. sur.dər		*

Input: /sur+ər/	SONSEQ	*ər	DEP[d]
e.　　　su.rər		*!	
f.　　　su.rr̩	*!		
g.　　☞sur.dər			*

Input: /sur+ər/	OCP[RHOTIC]	DEP[d]
h.　　　su.rɚ	*!	
i.　　☞sur.dɚ		*

3.2.2　[d] Rhotacisation

The optional process of [d] rhotacisation in intervocalic consonants is a generic lenition process in an uninteresting position. If there is anything interesting to be learned from it, it is certainly in the monitoring of its social effects and patterning.

3.2.3　[r] Deletion

Again, without any phonetic description of the words showing this r-deletion behavior, it is difficult to come to any conclusions. These are coda /r/s, which tend to be quite vocalic in neighboring German dialects. It is quite conceivable that the phonetic nature of these [r]s makes them quite difficult to distinguish from the nuclear vowel alone in the pre-alveodental context and that they are not actually deleted at all.

3.3　Coda Devoicing

According to Hoekstra (2001, p. 86), coda obstruents are devoiced, just as they are in German. Visser (1997, p. 50) contradicts this and gives the following conditions on fricative voicing (see also the table in (4.3)):

(3.4)　　1. a voiced fricative occurs:
　　　　　(a) after a long sequence (long vowel, falling or centralizing diphthong, short vowel + liquid) at the end of a word;
　　　　　(b) within a word after a long sequence at the beginning of a syllable containing schwa.

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2. a voiceless fricative occurs:
   (a) after a short vowel or a rising diphthong at the end of a word;
   (b) within a word after a short vowel or a rising diphthong at the beginning of a syllable containing a schwa.

3.4   [g], [ɣ], and [x]

Between [g], [ɣ] and [x], there seem to be two phonemes, but it is not completely clear how the phonological space is dived between them. This is the pattern of allomorphy that Cohen at al[4] called an *archiphoneme.* The data are a bit confused because Visser lists minimal pairs first for /k/ and /x/, and then for /k/ and /ɣ/ (as in (3.5)), but notes that the forms with /ɣ/ are pronounced with [x]. It is unclear, then, what difference Visser is positing between /x/ and /ɣ/. To the extent that evidence for alternations exists, I will treat each pair below.

(3.5)   1. /kIk/ 'whimper' - /kIx/ 'cough'
         2. /kIər/ 'time' - /gIər/ 'done'
         3. /rIək/ 'rick'[5] - /rIəɣ/ 'cobweb(s)'

3.4.1   [g] ∼ [ɣ]

Visser (1997, p. 55) calls this alternation "/g/-weakening," while Hoekstra (2001, p. 86) names it "/ɣ/-strengthening." An alternation is visible in "-ology" words, as shown in (3.6). [g] is found exclusively in word initial onsets and the onsets of stressed syllables, while [ɣ] is found only in non-stressed, non-initial onsets. The positions for [g] are quite strong (cf. the distribution of English asperation) where as the positions for [ɣ] are somewhat weak (cf. the distribution of English tapping), so both directions seem equally valid. The principle of Richness of the Base demands that input representations be as unconstrained as possible (ideally not at all), so I propose that both processes are part of the language. If the input contains a /g/ that ends up in a weak position, it should be spirantized; if it contains a

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[4]as quoted in Visser (1997, p. 54)

[5]a stack (as of hay) in the open air; a pile of material (as cordwood) split from short logs

/ɣ/ that ends up in a strong position, it should be fortified. The selection of a phoneme is irrelevant in this case because—as shown in (3.7)—either [g] or [ɣ] in the input will produce the correct output.

(3.6) [psixoːloːɣisk] 'psychological' vs. [psixoːloˈɡi].[6]

(3.7)

Input: psixoːloːgisk	*Strong-ɣ	*Weak-g	Ident[Continuancy]
a. psixoːloːgisk		*!	
b. ☞psixoːloːɣisk			*
Input: psixoːloːɣi	—	—	—
c. psixoːloˈɣi	*!		
d. ☞psixoːloˈɡi			*

3.4.2   [x] and [g]

Visser (1997, p. 55) uses an argument that I do not understand to declare that "/x/ and /g/ have phonemic value." He states that the first two minimal pairs in (3.5) constitute a "genuine minimal pair" for [x] and [g] because "/k/ and /x/ and /k/ and /g/ differ in one feature, viz. [±cont] and [±voice]." This makes no sense to me because Visser also claims that [x]–coda only—and [g]—onset only—are in complementary distribution. This makes a very interesting question about the position of [x] in [psixoːloːgisk]; it looks quite likely to be an onset, but Visser is forced to analyze it as a coda. Hoekstra does not give any syllabification for his data. I am unaware of any alternation between [x] and [g].

3.4.3   [x] ∼ [ɣ]

This alternation can be mostly subsumed under the analysis of coda devoicing in section 3.3. [mIx] 'fly; midge' appears in compounds as *miɣə–*.

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[6]Hoekstra (2001) p. 86.

Chapter 4

Onsets in Frisian

Visser (1997) is an analysis of the Frisian syllable in the lexical phonology framework. In this chapter, I take the data from Visser's dissertation and reanalyze the formation of onsets to give an optimality theoretic account. I will start with an inventory of the segments available in Frisian onsets and then shown how these can be built up into onsets of first two and then three consonants at the beginning of the word. I will end with a discussion of how these clusters pattern intervocalically.

4.1 Onset consonants

The table in (3.1) shows the consonant phonemes in Frisian and their allophones. The phones in bold type are excluded from the (at least first-syllable) onset position.

[ŋ] can be excluded on the grounds that is probably not a phoneme of Frisian and is likely the result of a rule that simplifies /ng/ to [ŋ] and—as shown below—/ng-/ is an impossible onset cluster in Frisian. In a true richness of the base approach, one would have to consider the possibility of /ŋ/ in the input. The explanation would then require the stipulation of an undominated *ŋIN ONSET constraint, which is shared by the other Germanic languages.

The voiced fricatives are devoiced when they appear in onset position[1]. In OT, this

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[1]as evidenced by loan words with initial voiced fricatives; see Visser (1997) p. 49.

can be seen as positional faithfulness (i.e., coda obstruents should be faithful to their voicing specification) and context-free markedness (no voiced fricatives). Such a faithfulness constraint seems odd for a member of the Germanic language family, which has a strong tendency to devoice coda obstruents, but Frisian allows all of the phonemes in (3.1) in coda position, so perhaps there is merit to it. Alternatively, this could be analyzed the action of a positional markedness constraint (no voiced fricatives in the onset) against a context-free faithfulness constraint maintaining voicing everywhere. The first analysis seems simpler in a way, because each constraint is only comprised of two features (i.e., voiced & fricative and obstruent & coda); the second analysis requires a triple feature constraint (voiced + fricative + onset). So justified, I propose the constraints in (4.1) and (4.2), whose interaction is shown in (4.3).

(4.1) ***VZɣ**- No voiced fricatives.

(4.2) **IDENTVOICE[CODAOBS]** - Obstruents syllabified into codas should have the same specification for voicing as their corresponding segments in the input.

(4.3) /iːz/ → [iːz] 'ice'; /zoː/ → soː 'zoo'

Input: /iːz/	IDENTVOICE[CODAOBS]	***VZɣ**	IdentVoice
1a. ☞iːz		*	
1b. iːs	*!		*
Input: /zoː/			
2a. zoː		*!	
2b. ☞soː			*

When loan words arrive with initial /x/ (common in Dutch) the first consonant is realized as [g]. This is difficult to capture in OT because the input has changed more than it needs to. The voiceless /k/ is closer in features to /x/ than is /g/. Moreover, dorsal and onset obstruents are more likely to be voiceless than voiced. The main motivation for the [g] pronunciation seems to be that the words are written "g-" in Dutch, but I feel queasy about proposing an orthographic-faithfulness constraint.

4.2 Biconsonantal Onsets

The fundamental constraints governing consonant clusters in Frisian are the Sonority Sequencing Principle—formalized as a constraint in (4.4)—and **MAX** and **DEP**, respectively constraints against deletion and epenthesis. Assuming that the constraint against complex syllable edges is universal, a language like Frisian in which onsets and codas can be consonant clusters must have **MAX** and **DEP** ranked higher than the constraint or constraints that militate against complex syllable edges. Combinations of consonants which violate markedness constraints between Max and Dep and the complex edge constraints will surface as clusters whereas combinations violating markedness constraints ranked higher than Max and Dep will be altered somehow (e.g., split through epenthesis or simplified through deletion).

For the moment, I adopt Visser's version of the sonority scale, shown in (4.6)[2]. I also start with the assumption that the minimal sonority distance is one. With these assumptions, there are three possible combinations of two consonant onsets: obstruent + liquid, obstruent + nasal, and nasal + liquid. There are also exceptional clusters—i.e., clusters which violate the sonority sequencing principle—where the sibilant /s/ forms an onset with the voiceless obstruents.

(4.4) **SONSEQ** (undominated) - between a segment and the peak of its syllable there can only be segments of higher sonority.

(4.5) **SD1** - the minimal sonority distance is one.

(4.6) Obstruents Nasals Liquids   Glides and Vowels
          1   2   3   4-7 from close to open

4.2.1 Obstruent + Liquid

Most onsets of this type are allowed and attested in Frisian; the table in (4.7) shows the possible and impossible clusters. One intuition is that clusters like *tl-, *dl-, *sr-, and *vl- are bad because they have the same specification for continuancy[3], in violation of **OCP[CONT]**

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[2]see Visser (1997) p. 83.

[3]I am assuming for the moment that /l/ is a non-continuant. For an analysis of the continuancy of /l/ in Frisian see ibid. pp. 88–89.

(4.8). This is inadequate, however, because pl-, bl-, kl- and fr- are good onsets even though the segments share the same specification for continuancy. Another explanation is that Frisian dislikes consonant clusters specified for the same place, in violation of **OCP[Place]** (4.9). This is also inadequate as tr- and dr- are good onsets in spite of sharing the same place of articulation. For the moment I will leave this unresolved and take it up again after a discussion of obstruent + nasal clusters.

(4.7) pr- pl-   tr- *tl-   kr- kl-
       br- bl-   dr- *dl-   gr- gl-
       v'r- *v'l-
       fr- fl-   *sr- sl-

(4.8) **OCP[Cont]** - Neighboring consonants cannot have the same specification for continuancy.

(4.9) **OCP[Place]** - Neighboring consonants cannot have the same specification for place.

4.2.2 Obstruent + Nasal

Obstruent + nasal clusters are more restricted in Frisian than obstruent + liquid clusters; the possible obstruent + nasal onsets are shown in the table in (4.10). The parenthetical items are not explicitly disallowed in Visser's dissertation but they are not mentioned as possible onsets, either. With the exception of sn-, these clusters are all heteroorganic; they also all violate **OCP[Cont]**. This leads to the intuition that clusters can share specification for continuancy and they can share specification for place, but they cannot share both features. This is expressed formally as a conjoined constraint given in (4.11).

(4.10) *pm- pn-   (*tm-) *tn-   (*km-) kn-
        *bm- *bn-   (*dm-) *dn-   (*gm-) gn-
        (*v'm-) (*v'n-)
        *fm- fn-   sm- sn-

(4.11) **OCP[Cont]&OCP[Place]** - No cluster may violate both **OCP[Cont]** and **OCP[Place]**.

The conjoined constraint eliminates the obstruent + liquid pairs *tl-, *dl-, and *sr- as well as the obstruent + nasal pairs *pm-, *bm-, *v'm-, *tn-, and *dn-. The lack of *v'l-, *bn-, *fm-, *tm-, *dm-, *km-, and *gm- still needs to be explained. Visser suggests that *fm- is eliminated by a double labial filter, but **OCP[PLACE]** takes care of most of what that would cover. What Visser ignores is that all of the forms obstruent + [m] are banned. This leads me to propose that there is a condition on place specification in Frisian which I formalize in (4.12). The idea behind **ONSETCOND** is that the obstruents have a place feature and that the liquids and nasals (unspecified for place) get the "default" coronal place of articulation instead of getting the place feature of their accompanying obstruent. **ONSETCOND** devalues **OCP[PLACE]** somewhat (i.e., reduces it to a double coronal filter) but it makes up for it with the number of cases that it covers. As a final point in this section, I must admit that I do not have a good explanation for the ban on *bn-. Additionally my constraints incorrectly disallow sn-, an issue that I will take up again later.

(4.12) **ONSETCOND** - An onset has exactly one specification for place.

4.2.3   Nasal + Liquid

Frisian has an all-out ban against nasal + liquid pairs. Earlier constraints have eliminated all of these pairs with the exception of *nr- and *mr-, both of which are unmentioned in Visser (1997). To avoid loose ends, it seems desirable to eliminate these two as well. One way to do so would be to refine the notion of the sonority scale and minimal sonority distance. The new definitions in (4.13) and (4.14) should maintain all of the earlier sonority distinction but also eliminate nasal + liquid pairs.

(4.13) Sonority scale, revised: Obstruents   Nasals   Liquids   Glides and Vowels
                                              1   3   4   5–8

(4.14) **SD2** (replaces **SD1**) - the minimal sonority distance is two.

4.2.4   Sibilant + Obstruent

Most analyses of syllable structure in languages like Frisian appeal to the notion of extra-syllabicity. I believe that this is not necessary, at least for the patterning of onsets. Instead, my analysis of exceptional clusters is based on coalescence. **Uniformity**(4.15) is the constraint that militates against coalescence, which interacts with the other constraints in Frisian in such a way that only certain pairs of consonants can coalesce. The clusters that can be formed by coalescence are sp-, ps-, st-, ts-, sk-, ks-, and perhaps sf- (only in loan words) and sn- (which would allow for its exception to (4.11), the conjoined OCP constraint). Crucially, all of these pairs include [s]. My suggestion is that Frisian has a series of pre- and post-"syballized" stops (and [f] and [n]), and that the markedness constraints against these stops are ranked low enough that they can surface, whereas the non-occurring cases of coalescence have more highly ranked markedness constraints against them. The segments might have the same or very similar duration to their non-syballized counterparts which would be evidence that the stop and fricative are sharing a segment.

As for the ranking of **Uniformity**, the only situation in which we would want two segments to coalesce—provided the relevant markedness constraints are ranked lowly enough—is to rescue a violation of the sonority sequencing principle. This would suggest that **Uniformity** is ranked just below the general **Max** and **Dep** constraints. A sample optimization in (4.16) shows the motivation for the ranking of **Uniformity**. Recall also that **Uniformity** was implicated in the analysis of vowel nasalization to work around some very nasty opacity if the nasal was analyzed as deleting. That is a more simple case of coalescence, but I think that its presence in Frisian shows that violating **Uniformity** is a viable repair strategy for Frisian speakers.

(4.15) **Uniformity** - "don't coalesce." Assess one violation for every segment in the output that has multiple correspondents.

(4.16) /ksenon/ → [kˢe.non] 'xenon'

Input: /k$_i$s$_j$enon/	SonSeq	Max, Dep	Uniformity
a. k$_i$s$_j$e.non	*!		
b. s$_j$e.non		*! (Max)	
c. k$_i$ə.s$_j$e.non		*! (Dep)	
d. ☞kˢ$_{i,j}$e.non			*

SonSeq, Max, Dep ≫ Uniformity

4.3 Triconsonantal Onsets

Like English, Frisian has a set of triconsonantal onsets. It has, in fact, the same set as English. According to the first theory of sonority laid out in (4.6) and (4.5), there should also be clusters of the type obstruent + nasal + liquid. The fact that these do not occur is additional evidence for the sonority refinement in 4.2.3.

The triconsonantal onsets that are allowed are the sibilant + stop pairs followed by the same consonants that could follow the obstruent involved. A convenient explanation for this is the principle of resolvability, formalized in (4.17). This analysis, however, fails to account for the lack of *skn- and *spn-. One possibility is that the "pre-sibilized" stops fill in the vacant #2 two spot in the sonority scale in (4.13), which would allow them to combine with liquids but not with nasals.

(4.17) **Resolvability** - The sequence (C$_1$C$_2$)C$_3$ is analyzed as C$_2$C$_3$.

4.4 Intervocalic Clusters

The syllabification of intervocalic clusters must in theory follow from the same set of constraints as the syllabification of word-initial clusters. The differences in their patternings, when there are any, must be due to their environment. There are two major differences that are found in Frisian. First, many of the clusters that were disallowed as first-syllable onsets do form onsets word-medially. Second, sibilant + obstruent pairs do not coalesce,

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although—as the tableau in (4.18) shows—this is not at all surprising as earlier constraints already predict this.

(4.18)

Input:	/kɔstɛt/	SonSeq	Max, Dep	Uniformity
a☞	kɔs.tɛt			
b.	ko.ˢtɛt			*!
c.	ko.stɛt	*!		
d.	ko.tɛt		*! (Max)	
e.	ko.sə.tɛt		*! (Dep)	

The introduction of new clusters word-medially is somewhat surprising as most languages are allow a greater variety of sequences on word edges than on syllable edges in general. The active constraint here is **Syllable Contact** (4.19). As shown by the selection of [paː.tnɚ] in (4.20), **Syllable Contact** must rank above the conjoined OCP constraint in (4.11). Word-medial tl-, dl-, and dn- can be formed the same way.

(4.19) **Syllable Contact** - there may not be rising sonority over a syllable boundary

(4.20) /paːtnɚ/ → [paː.tnɚ]

Input:	/paːtnɚ/	Syllable Contact	OCP[Cont]&OCP[Place]
a.	paːt.nɚ	*!	
b.	☞paː.tnɚ		*

Syllable Contact ≫ OCP[Cont]&OCP[Place]

The role of the syllable contact law is a quite interesting one cross-linguistically. In languages that allow branching onsets (i.e., languages in which the constraint against complex onsets is out-ranked by constraints that block cluster simplification), it plays the role of the onset-maximizer. In languages without branching onsets, it acts like a guardian angel, protecting the language from acquiring them: "Don't say something your children will mistake for a branching onset."

4.5   Strange Continuancy

I am as of yet unable to account for certain things like the ban on *v'l-. Only half in jest, I could propose a constraint like **OCP[StrangeContinuancy]** to take advantage of the fact that both /v'/ and /l/ are very different from the other [-continuant] consonants. The fundamental idea here is that continuancy is not a binary feature in the same way that sonority is not a binary feature. **OCP[continuancy]** under this view would be better stated as a "continuancy sequencing principle" and a related constraint, following the paradigm of sonority.

4.6   Conclusion

The remaining issues, such as *bn- do not concern me as much as Visser also does not give them any explanation nor data to show what the behavior in Frisian might be.

Using the OT framework seems to capture many of the intentions Visser had in mind. For example Visser assumes that "[filters and principles] have an output-checking function ...since it is in this way that [the syllabification process] can operate as freely as possible,"[4] and he peppers his work with phrases like "Frisian has a tendency to avoid this," all of which hints at the ideas of OT. Additionally OT constraints are somehow easier to reuse and several of Visser's filters were handled by constraints inspired by other of his filters without redefinition. All in all, the results of this reanalysis seem to point to the fact that OT is really on the right track for describing human languages.

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[4]Visser (1997) p. 80.

Bibliography

Århammar, Nils, Das Nordfriesische im Sprachkontakt. in: **Munske, Horst Haider, editor:** Handbuch des Friesischen. Tübingen: Max Niemeyer Verlag, 2001, pp. 313–353.

de Haan, Germen J., Recent Trends in Frisian Linguistics. in: **Munske, Horst Haider, editor:** Handbuch des Friesischen. Tübingen: Max Niemeyer Verlag, 2001, pp. 32–47.

Hoekstra, Jarich F., Standard West Frisian. in: **Munske, Horst Haider, editor:** Handbuch des Friesischen. Tübingen: Max Niemeyer Verlag, 2001, pp. 83–97.

Visser, Willem, The Syllable in Frisian. Ph. D thesis, Holland Institute of Generative Linguistics, 1997.