Velar fronting in German dialects

A study in synchronic and diachronic phonology

Tracy Alan Hall

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Contents

List of Maps

1 Introduction

> Man betrachte auch eine beliebige Gruppe von verwandten Mundarten; man wird sehen wie die Bedingungskreise der Lautgesetze sich von Ort zu Ort mannigfach verändern, man wird hier gleichsam die räumliche Projection zeitlicher Unterschiede erkennen[1]
>
> Hugo Schuchardt (1885: 24)

> … *Ortsgrammatiken* provide enormous potential for detailed work by historical linguists and phonologists … Although much seminal analytic work has already been carried out, there is great need for the individual dialects and their interrelationships to be studied within broader well-grounded theoretical and typological frameworks.
>
> Robert Murray (2010: 82)

1.1 An unfortunate gap

The distribution of German dorsal fricatives – palatal [ç] and velar [x] – has preoccupied linguists of diverse theoretical persuasions for over eighty years. Scholars who have discussed the patterning of those sounds include – but are not limited to – Bloomfield (1933), Trubetzkoy (1939), Leopold (1948), Trim (1951), Trost (1958), Werner (1972), Philipp (1974), Griffin (1977), Wurzel (1980), Russ (1982), van Lessen Kloeke (1982), Meinhold & Stock (1982), Hall (1989), Wiese (1996b), Merchant (1996), Noske (1997), Halle (2005), Glover (2014), and Kijak (2021).

It would be fair to say that the works cited above have concerned themselves primarily with the patterning of [ç] and [x] in Modern Standard German (MoStGm) – defined here as the pronunciation encoded in the pronouncing dictionaries (Siebs 1969, Krech 1982, Mangold 2005) – but that they have said very little about

[1]'Just consider any particular group of related dialects. You will see how the conditional environments of the sound laws change from place to place. You will, as it were, perceive the spatial projection of temporal differences'. Translated by Vennemann & Wilbur (1972).

the occurrence of those fricatives in regional German dialects. Two notable exceptions to that trend are Herrgen (1986) and especially Robinson (2001), who both stress that much light can be shed on the correct analysis of the MoStGm facts by considering the patterning of [ç] – the so-called ICH-LAUT ('ich-sound') – and [x] – the so-called ACH-LAUT ('ach-sound') – in non-standard varieties of German.

I contend that the cross-dialectal approach advocated by linguists such as Herrgen and Robinson represents a step in the right direction but that neither of those linguists goes far enough. In fact, it will be clear in the following chapters that those works merely scratch the surface of a deceptively complicated beast because they fail to consider enough case studies from geographically-diverse regional dialects.

The topic addressed in this book has not only been neglected by phonologists, but also by dialectologists. To cite one recent example, volume 4 of the *Handbücher zur Sprach- und Kommunikationswissenschaft* (Herrgen & Schmidt 2019) provides an impressive 1200 page overview of German dialects. That survey includes all of the dialect areas depicted on Figure A.1, including varieties of German spoken in North and South America, Africa, Australia, and Oceania. Given the breadth of that state-of-the-art work, it is surprising that none of the chapters discuss the distribution of [ç] and [x] in any detail.

The goal of the present study is to fill that gap. I consider over three hundred original sources for all of the major dialect regions spoken over a period of about one hundred sixty years (1860 to 2020) throughout the German-speaking world as it existed before 1945 up to the present day. In doing so I uncover a wealth of new data (hinted at in the Murray quote given above) involving the patterning of velar and palatal sounds. It is my hope that the data and my analysis thereof will redefine the kind of research question future works will address with respect to the patterning of German dorsal fricatives.

In the case studies presented below I demonstrate that the phonology of palatals (such as [ç]) and velars (such as [x]) can differ from one dialect to the next in subtle but also predictable ways. The synchronic differences among dialects referred to here will be argued to mirror the way in which the original rule relating those sounds progressed historically from a low-level phonetic process to a phonological rule. The latter process has subsequently undergone changes in some varieties resulting in various idiosyncrasies not discussed in previous research that only make sense when those dialects are compared with other dialects without those quirks.

The remainder of this chapter is structured as follows. In §1.2 I provide a brief overview of the patterning of dorsal fricatives in MoStGm and summarize some of the contentious research questions that have been the object of debate in the past. §1.3 explicates the title of this book as it relates to MoStGm and to the new data from German dialects, which are outlined briefly in §1.4. The latter section also poses a series of new research questions regarding the new patterns exemplified in German dialects. §1.5 justifies the assumption made in the present work – echoed in the extensive literature referred to earlier – that the phonology of German need only refer to two dorsal articulations (velar and palatal) but not to finer-grained distinctions. In §1.6 I provide some remarks on the data and sources thereof. Finally, §1.7 gives a brief outline of the structure of the remaining chapters.

1.2 Modern Standard German facts and summary of previous research

The words listed in (1) reveal that [x] surfaces after back vowels (e.g. [uː] in 1a) and [ç] after front vowels (e.g. [ɪ] in 1b), the two coronal sonorant consonants ([l] and [n] in 1c), or the dorsal rhotic, which surfaces either in coda position after a short vowel as the uvular consonant [ʀ] or the vowel [ɐ]. No native word has a dorsal fricative in word-initial position. See Chapter 17 for more extensive discussion on the patterning of MoStGm dorsal fricatives.

(1)	a.	[buːx]	Buch	'book'
	b.	[lɪçt]	Licht	'light'
	c.	[dɔlç]	Dolch	'dagger'
		[mœnç]	Mönch	'monk'
	d.	[dʊʀç], [dʊɐç]	durch	'through'

The data in (1) show that [x] and [ç] stand in complementary distribution: The former sound occurs after a back vowel and the latter one after a front vowel, a liquid, or /n/.

The examples in (2) illustrate that there are morphemes displaying an alternation between [g] and [ç]. That type of morpheme is usually captured in the literature by positing an underlying lenis stop (/g/) that shifts to the corresponding fricative and surfaces as [ç]. Note that the [ç] derived from /g/ in (2a) – like the [ç] in (1b) – surfaces after a front vowel ([ɪ]).

(2)	a.	[køːnɪç]	König	'king'
	b.	[køːnɪgə]	Könige	'kings'

The generalizations described in the preceding paragraphs need to be amended in light of the additional examples (3), which show two additional contexts for palatal [ç]. First, [ç] surfaces as the first segment in the diminutive suffix *-chen* even if a back vowel precedes that suffix (in 3a). Second, [ç] occurs word-initially in loanwords (in 3b).

(3) a. [tauçən] Tauchen 'rope-DIM' (cf. [tau] Tau 'rope')
b. [çemiː] Chemie 'chemistry'

The MoStGm data presented above – especially those involving palatal [ç] in *-chen* in (3a) – have spawned a sizeable literature couched in a wide variety of theoretical frameworks, some of which was cited in §1.1. Due to the near complementary distribution of [x] and [ç], there is widespread agreement that the two fricatives are positional variants, in which case one of the sounds derives from the other.

One question discussed at length in the literature is whether or not the underlying sound – the TARGET – is velar or palatal. Thus, if /ç/ is taken to be basic then the rule creates [x] – the OUTPUT – after back vowels – the TRIGGERS –, as in (4a). Note that the underlying palatal treatment also accounts for the occurrence of [ç] in (1c) and (3b) as well as [x] in (1a). However, that treatment needs to account for the fact that [ç] surfaces after the back vowel [ɐ] in items like [dʊɐç] 'through' in (1d) and in the diminutive suffix *-chen* in (3a), e.g. [tauçən] 'rope-DIM'. If /x/ is taken as the target segment and [ç] is derived from that sound, then the rule apparently necessitates two disjunct contexts, as in (4b). Although the two sets of triggers in (4b) can account technically for the data in (1), it is not clear how that rule generates the palatal in (3). What is more, if the rule involved is an assimilation, then (4b) is incomplete at best because it needs to provide a convincing argument for the occurrence of the palatal after the dorsal rhotic [ʁ] and its non-front variant [ɐ] in (1d).[2]

(4) a. /ç/ → [x] / {backvowels} __

b. /x/ → [ç] / $\left\{\begin{array}{c}\text{front vowels}\\ \text{sonorant consonants}\end{array}\right\}$ __

In an important study, Robinson (2001) defends an analysis in which the underlying segment in the rule relating [x] and [ç] is /x/ and not /ç/. He argues at length that it is possible – and desirable – to analyze the two disjunct groups

[2]In my comparison of (4a) and (4b) I abstract away from how the [g]~[ç] alternations in (2) are analyzed.

of triggers in (4b) featurally in a unified way so that the change expressed is an assimilation. In addition, he sees palatal [ç] in (3b) as a nonnative phoneme /ç/, which is also his treatment of the palatal [ç] (/ç/) in the loan suffix -*chen* in (3a).

Robinson makes a compelling case for deriving palatals from velars; in fact, I adopt that position and criticize the "palatal to velar" alternative in (4a). A consequence of the approach with underlying velars is that it necessitates an answer to the question of how the two categories "front vowels" (in 1b) and "/n l ʀ/" (in 1c,d) can be united as the set of triggers. It needs to be stressed that Robinson's analysis of German dorsal fricatives – his argument for underlying velars being one example – hinges crucially on data from regional varieties of German not usually discussed in the published literature. This is a significant point because the implication is that Robinson's claims can potentially be falsified by data from German dialects he might not have considered.

Robinson makes two assertions I strongly dispute. First, his analysis of dorsal fricatives implies that there is a single pandialectal rule (p. 113), according to which a palatal fricative is derived from a velar. Second, Robinson opines that his rule is "completely automatic" (p. 19) and that it is a "low-level, phonetic rule" (p. 77).

In the present book I evaluate and reject the two claims described in the preceding paragraph. I do so by investigating the patterning of dorsal fricatives in a number of regional German dialects discussed neither by Robinson (2001) nor – to the best of my knowledge – by any of the other linguists cited above. In the course of that discussion I uncover new data and develop a program of research involving those data, which I summarize briefly below.

1.3 Definition of velar fronting

As noted in the previous section I adopt the position asserting that the distribution of [x] and [ç] in MoStGm requires an underlying velar (/x/) to be realized as a palatal ([ç]) and not the reverse. The rule relating those two sounds – stated provisionally in (4b) – is referred to throughout this book as Velar Fronting, which can be thought of as a subtype of velar palatalization (e.g. Bateman 2007). See §2.3 for more in-depth discussion.

I define velar fronting henceforth as the realization of any velar consonant – and not simply [x] – as the corresponding fronted sound. The change in question can be diachronic or synchronic. The way in which velar fronting is characterized is necessarily determined by the German dialect data summarized briefly in §1.4 – data revealing that the targets can be drawn from the sounds listed in the velar column in Table 1.1(a). The output of velar fronting is the corresponding palatal sound, as indicated in the final column of Table 1.1(a). The term velar fronting also refers to the realization of the fricative [x] as the alveolopalatal (sibilant) fricative [ɕ], as in Table 1.1(b). As indicated below, I classify both the target (velar) and the output (palatal/alveolopalatal) as dorsal.[3]

Table 1.1: Velar fronting targets and outputs

(a) Palatal output

	dorsal	
	velar	palatal
	(target)	(output)
Stop	[k]	[c]
	[g]	[ɟ]
Fricative	[x]	[ç]
	[ɣ]	[ʝ]
Affricate	[kx]	[kç]
Nasal	[ŋ]	[ɲ]

(b) Alveolopalatal output

	dorsal	
	velar	alveolopalatal
	(target)	(output)
Fricative	[x]	[ɕ]

Velar fronting triggers typically consist of front vowels – a change I interpret as an assimilation; recall (1a) vs. (1b). However, the set of triggers can also include front (coronal) sonorant consonants like [n] and [l]; recall (1c). A surprising finding is that velar fronting is not always assimilatory because it can occur in many varieties of German in the context of any segment, front or back.[4]

An important finding in this book concerns the DIRECTIONALITY of velar fronting. If a target for velar fronting is situated between two sonorant sounds then the trigger for velar fronting is always to the left of the target. This means that velar fronting involves assimilation from left to right (PROGRESSIVE) and not right to left (REGRESSIVE) assimilation.

[3] In my description of velar fronting I have intentionally refrained from providing phonetic detail, e.g. the exact position of the tongue or the formant structure of velars and palatals/alveolopalatals. The reason is that my treatment of velar fronting in the ensuing chapters is phonological and not phonetic. See §1.5, where I conclude that a proper understanding of velar fronting in German dialects does not (and should not) require reference to fine-grained phonetic detail.

[4] A claim I justify at length in the following chapters is that the assimilatory change from velar to palatal is never triggered by (dorsal) sounds like [ʁ] or [ɐ]; recall (1d).

In sum, velar fronting is defined according to the four properties listed in (5).[5]

(5) a. Targets: Any velar consonant
 b. Triggers: Typically (but not always) a front segment
 c. Outputs: Palatal or alveolopalatal
 d. Direction: Left to right

The preceding discussion should reveal the inappropriateness of the term Dorsal Fricative Assimilation, which is probably the most common way of referring to the rule of MoStGm in (4a,b) in the recent literature. First, the process in question is not always assimilatory, and second, the target segments need not be fricatives.

1.4 New data and new research questions

1.4.1 Parameters of variation and opacity

1.4.1.1 Overview

This book offers an in depth investigation of velar fronting (as defined above) in German dialects. That change can involve either the diachronic fronting of a historical velar or the synchronic realization of an underlying velar as fronted (palatal).

Before introducing the new data referred to above, I clarify the object of investigation, namely "dialects of German". In this book I refer to both HGm and LGm under the same category label ("German"), although it needs to be stressed that those two groups are different enough that they should be considered separate, but closely related, Continental WGmc languages. My view of HGm and LGm as separate languages – and not as dialects of the same language – is also implicit in the family tree in Appendix E. I offer no new definition of "dialect" and therefore simply assume without argument that that term refers to any regionally distinctive variety of a language (in this case either HGm or LGm). Thus, Wph and Eph are two LGm dialects, while Swb and Bav are two HGm dialects. On the other hand, I also employ the word "dialect" to refer to very specific regional varieties within any one of those larger categories. For example, there may be two towns in the Swb-speaking region of Germany separated by a mere 10 km, and yet I

[5]The data I discuss in this book (summarized in §1.4) also involve velar fronting in word-initial position. As stated below, property (5d) only holds if the target is not word-initial.

refer to the HGm (Swb) language spoken in those two towns as two separate "dialects". The dialects discussed below are almost always defined in terms of space (regionally), but "dialects" in the present context may also be distinguished in terms of socio-linguistic variables. Seen in that light, my usage of the term "dialect" is equivalent to the more general term "variety", and for that reason I often employ "dialect" and "variety" interchangeably.

The new data investigated in the present work involve velars and palatals in two contexts: (i) after a vowel or a sonorant consonant (henceforth POSTSONORANT POSITION), or (ii) word-initial position. Examples exemplifying (i) are listed in the final column of (6). The corresponding WGmc reflexes for the modern-day velars and palatals are provided in the first column. Appendix F summarizes those developments into HGm varieties on which MoStGm are based. Phonetic representations for the words listed below are not indicated because those realizations differ from dialect to dialect. The phonetic representation for the vowels in these words can be inferred on the basis of the orthography. In many regional varieties velar fronting can also affect the lenis velar fricative (WGmc ⁺[ɣ]), as in (6c), and in others velar stops and the velar nasal, as in (6d,e).

(6)
a. WGmc ⁺[k] > [x]/[ç] — Sache 'thing', brechen 'break-INF', Dolch 'dagger'
b. WGmc ⁺[x] > [x]/[ç] — Nacht 'night', dicht 'dense', fechten 'fence-INF'
c. WGmc ⁺[ɣ] > [ɣ]/[ʝ] — Wagen 'car', liegen 'lie-INF', folgen 'follow-INF'
d. WGmc ⁺[kk] > [k]/[c] — Rock 'skirt', dick 'fat'
e. WGmc ⁺[ŋg] > [ŋg]/[ɲɟ] — Zunge 'tongue', Finger 'finger'

Word-initial velars (=context ii) can also show the effects of fronting. I list below typical lexical items and their WGmc reflexes for the word-initial fricatives [x ç] (in 7a) and for [x ç] after a word-initial sibilant (in 7b). Some varieties also front velar stops, as in (7c).

(7)
a. WGmc ⁺[ɣ] > [x]/[ç] — Gast 'guest', gestern 'yesterday', Glück 'fortune'
b. WGmc ⁺[sk] > [sx]/[sç] — Schaf 'sheep', schöpfen 'ladle-INF', schlafen 'sleep-INF'
c. WGmc ⁺[k] > [k]/[c] — Kuh 'cow', Kind 'child'

Individual varieties of German can possess either postsonorant velar fronting in (6), word-initial velar fronting in (7), or both. Those fronting processes exhibit variation along the three parameters listed in (5a–c).

1.4.1.2 Targets

In many varieties the set of target sounds consists of all and only velar fricatives (both [x] and [ɣ]); hence, palatals occur in *brechen* 'break-INF', *dicht* 'dense', and *liegen* 'lie-INF' and velars [x ɣ] after back vowels, e.g. *Sache* 'thing', *Wagen* 'car'. However, in other dialects the target for fronting consists solely of [x] but not [ɣ]; hence, we have palatal [ç] in *brechen* 'break-INF' and *dicht* 'dense' and velar [x] in *Sache* 'thing', but velar [ɣ] surfaces in both *Wagen* 'car' and *liegen* 'lie-INF'. In another set of dialects, velar fronting affects not only [x] and [ɣ], but also velar stops and the velar nasal; hence, [c] surfaces in *dick* 'fat', [ɲ] in *Finger* 'finger', [k] in *Rock* 'skirt', and [ŋ] in *Zunge* 'tongue'.

A similar generalization involving targets holds for word-initial position; hence, some dialects have [ç] in *gestern* 'yesterday' and *schöpfen* 'ladle-INF' and [x] in *Gast* 'guest' and *Schaf* 'sheep', while others also have [c] in *Kind* 'child' and [k] in *Kuh* 'cow'.

1.4.1.3 Triggers

The set of front vocalic triggers for velar fronting exhibits variation according to the height dimension: In some systems the triggers consist only of high front vowels, in others high and mid front vowels but not the low front vowels (e.g. [æ]), and in yet others all front vowels, regardless of height. For example, in some dialects [ç] surfaces after the high front vowel in *dicht* 'dense' but [x] after the mid front vowel in *fechten* 'fence-INF' and after the back vowel in *Nacht* 'night'.

The fronting of velars can also be induced by a coronal sonorant consonant ([r l n]). In one commonly occurring system, that change is triggered by all front vowels and all of those consonants, e.g. [ç] in *gestern* 'yesterday' and *Glück* 'fortune', but [x] in *Gast* 'guest'. However, in other varieties only front vowels, but not coronal sonorant consonants trigger fronting; e.g. [ç] in *gestern* 'yesterday' and [x] in *Glück* 'fortune' and *Gast* 'guest'.

In many localities, velar fronting has no segmental trigger at all. That type of system is particularly common in word-initial position, e.g. palatal [ç] occurs in *Gast* 'guest', *gestern* 'yesterday', and *Glück* 'fortune', while [x] is absent from word-initial position entirely. In this type of dialect, velar fronting is therefore not an assimilation.

1.4.1.4 Outputs

The segment created by the fronting of velar /x/ in MoStGm and in most German dialects investigated below is a (nonsibilant) palatal fricative [ç], although there is also a well-attested pattern whereby [ç] is realized as a (sibilant) alveolopalatal fricative [ɕ]; recall Table 1.1(b). For example, a word like [ɪç] 'I' is pronounced [ɪɕ]. I refer to the change to the [ɕ] output as ALVEOLOPALATALIZATION.

A major theme of this book is the ways in which velar fronting interacts with synchronic and diachronic changes creating or eliminating structures which can potentially undergo it or trigger it. The types of interaction referred to here are categorized in terms of the criterion referred to as TRANSPARENCY/OPACITY.

1.4.1.5 Transparency/opacity

In many dialects the relationship between velars (e.g. [x]) and the corresponding palatals ([ç]) is TRANSPARENT in the sense that velars only occur in the back vowel context and palatals only when adjacent to front sounds. In that type of system, independent processes can interact with velar fronting in two ways: (a) They can FEED velar fronting (by creating additional structures which the latter can undergo); or (b) they can BLEED velar fronting (by eliminating potential structures to which the latter could apply). For example, in one dialect historical /r/ is now realized as [x] after back vowels (e.g. *schwarz* [ʃwɔxts] 'black') and [ç] after front vowels (e.g. *Herz* [hɛçts] 'heart'). The change from /r/ to a dorsal fricative therefore feeds velar fronting. In another dialect the historical front vowel (diphthong) [ei] is now realized as the back vowel (diphthong) [ɔə]. Significantly, the historical fricative after that new back vowel is realized as [x] (e.g. *Zeichen* [tsɔəxə] 'sign'); hence, the change from [ei] to [ɔə] bleeds velar fronting. When [x] and [ç] have a transparent relationship they stand in complementary distribution and are classified as ALLOPHONES.

The transparent relationship between velars and palatals described above does not obtain in other dialects. For example, in many varieties, both dorsal articulations occur in the context of front segments. Thus, in addition to expected sequences like [iç], there are also unexpected ones like [ix]. In other systems velars and palatals both occur in the context of back segments; hence, expected sequences such as [iç] occur in addition to unexpected ones like [ɑç]. Both types of system exhibit OPACITY (e.g. Kiparsky 1982a, McCarthy 2009, Baković 2011); in particular, sequences like [ix] in the first set of dialects and [ɑç] in the second set are OPAQUE. A sequence like [ix] illustrates UNDERAPPLICATION because the fronting of velars after sounds like [i] fails to affect [x]. By contrast, a sequence like [ɑç] displays overapplication because the process fronting velars in the context of front vowels apparently even applies after certain back vowels.

1.4.1.6 Underapplication

There are two types that need to be distinguished:

In one system velar fronting can be shown to be an active synchronic process creating palatals (e.g. [ç]) from velars (e.g. /x/). The opaque velar ([x]) in the front vowel context (e.g. [ix]) is derived – both synchronically and diachronically – from an independent segment (represented with the abstract symbol /A/). Significantly, the only instances of opaque [x] involve [x] created from /A/. For example, in one dialect there are words like *Licht* [lɪçt] 'light' and *Bach* [bɑx] 'stream', where [ç] is the product of velar fronting from /x/. The same dialect has opaque words like *Hirsch* [hɪxʃ] 'deer', in which the surface [x] is the realization of /ʀ/. In that dialect words like [hɪxʃ] illustrate underapplication, and the rule creating [x] from /ʀ/ counterfeeds velar fronting.

In another type of system, velar fronting is active synchronically, but [x] surfaces unexpectedly in the context of front vowels in certain diphthongs. For example, [ç] (from /x/) occurs in *weich* [weiç] 'soft' and *leicht* [liːçt] 'easy', and [x] in *nah* [nɑːx] 'near'. However, [x] (/x/) also occurs after the diphthong [øi] (/øi/), e.g. *Rauch* [røix] (/røix/) 'smoke'. An important generalization is that [øi] was historically a back vowel ([ou]; cf MoStGm [ʀɑux]). Opaque velars like [x] occur after segments like [øi], which are referred to below as neutral vowels. Since [øi] is synchronically /øi/ and not /ou/, systems with neutral vowels do not involve a counterfeeding order, as described in the preceding paragraph. However, the fronting of that originally back sound [ou] to [øi] does exemplify the historical underapplication of velar fronting.

1.4.1.7 Overapplication

Two types are discussed below.

In one frequent pattern, palatals (e.g. [ç]) occur in the context of front vowels and certain nonfront sounds – represented here as [Bk] – and velars (e.g. [x]) in the context of nonfront sounds with the exception of [Bk]. Observe that palatal ([ç]) and velar ([x]) stand in complementary distribution. All instances of the palatal ([ç]) in the context of front vowels derive – both synchronically and diachronically – from the corresponding velar, but the opaque palatal ([ç]) in the context of [Bk] is underlying (/ç/) and not derived. Underlying (opaque) palatals in that type of system are referred to throughout this book as quasi-phonemes.

For example, in one dialect [ç] occurs after front vowels, e.g. *brechen* [brɛçə] 'break-INF', and [x] after all back vowels with the exception of [ɑː], e.g. [bux] 'book'. After [ɑː] the palatal surfaces, e.g. *schlecht* [ʃlɑːçt] 'bad'. Significantly, the back sound adjacent to all palatal quasi-phonemes ([Bk]) was historically front, e.g. the [ɑː] in [ʃlɑːçt] was once [e], but it is now synchronically back (/Bk/).

In another type of system, velars and palatals both surface in the neighborhood of back sounds. Since they can occur in the context of the same back vowels, velars and palatals CONTRAST in that context; hence, velars and palatals are both underlying sounds (e.g. /x/ and /ç/). Underlying palatals in that type of system are referred to throughout this book as PHONEMIC PALATALS. In dialects where palatals and velars are both phonemic, velar fronting can still be shown to be active synchronically in order to capture regular (i.e. exceptionless) alternations between velars and palatals. For example, in one dialect, [x] and [ç] contrast after the back vowel [ɑ], e.g. *Dach* [dɑx] 'roof' (/dɑx/) vs. *Deich* [dɑç] 'dike' (/dɑç/). The same dialect also has regular alternations involving [x] and [ç], e.g. *Buch* [bux] 'book' vs. *Bücher* [biçər] 'books'. In that type of alternation, /x/ is the underlying dorsal sound and [ç] is created by velar fronting after a front vowel. Significantly, the back vowel adjacent to the opaque (underlying) palatal was historically a front sound (e.g. the [ɑ] in [dɑç] 'dike') was once [ei]; hence, velar fronting overapplies in words like [dɑç] 'dike' from the diachronic perspective.

1.4.2 Interpretation of the dialect data

In the following chapters I present case studies for specific varieties of German illustrating the range of phenomena described above. From the synchronic perspective several versions of velar fronting are posited, which can differ according to the parameters listed in (5a–c). Synchronic velar frontings in German dialects have a historical interpretation, which I summarize briefly here:

At a very early stage (WGmc) velar fronting was not present at all; hence, velars like [x] surfaced as velar ([x]) even in the neighborhood of front vowels. That earlier stage is represented by a modern WGm language (Dutch). It is hypothesized that velars in the high front vowel context were realized in early stages of OHG and OSax as slightly more front than in the elsewhere context where they surfaced as true velars but that this type of fronting was phonetic (GRADIENT) and not phonological (CATEGORICAL). At a later stage of OHG/OSax the difference between velars in the high front vowel context and velars in the elsewhere case became exaggerated to the point where the former were realized (categorically) as palatal, while the latter remained velar. This is the stage at which velar fronting was PHONOLOGIZED. At that phonologized stage, velar fronting was present as a synchronic process, and the set of targets consisted solely of the fortis velar fricative [x] and the triggers consisted of the high front vowels like [i].

Phonologization occurred at a particular place (see below). The original rule of velar fronting then spread temporally and geographically to include a greater set of targets and/or triggers; see Bermúdez-Otero (2015) for a similar conception of language change. For example, the targets could spread to include not only fortis [x] but also lenis [ɣ]. The set of triggers could likewise later grow to subsume high and mid front vowels and then all front vowels.

Variation in terms of space (regional dialects) directly reflects changes along the temporal dimension (recall the Schuchardt quote from the beginning of §1.1). That interpretation of spatial variation is applied in the present book to velar fronting. Hence, I demonstrate that the various patterns displayed by modern dialects gives important clues telling us which regions have had velar fronting longer than others.

The evidence is strong that the phonologization of velar fronting and the subsequent expansion of triggers and targets occurred independently at more than one place (POLYGENESIS). Evidence against a single point of origin (MONOGENESIS) is that there are innovative velar fronting varieties surrounded by conservative varieties preserving velar sounds even in the front vowel context (VELAR FRONTING ISLANDS).

When velar fronting was expanding through time and space to include more and more targets and triggers, the velar ([x]) and the corresponding palatal ([ç]) stood in a transparent (allophonic) relationship. Changes affecting the velar fronting target could interfere with the original allophonic nature of velar fronting and then produce opaque forms. For example, when original front vowel triggers shifted to back vowels, overapplication effects could set in, i.e. palatal quasi-phonemes and/or contrasts between velars and palatals in the back vowel context. Likewise when original back segments were realized as front, underapplication might ensue, i.e. counterfeeding opacity or neutral vowels.

1.4.3 Velar fronting from the typological perspective

Rules fronting velar consonants to palatal (or palatal-like) sounds have been intensively investigated in previous research, e.g. Bhat (1978), Guion (1998), Bateman (2007, 2011), Kochetov (2011), and Recasens (2020). That typological literature has concerned itself with the ways in which the parameters in (5) can vary from language to language. A natural question to ask is how the data from velar fronting in German dialects fit into that typological research.

For example, a significant finding in the literature cited above is that the front vowels inducing the fronting of a velar can refer to the height dimension, whereby high front vowels are more favorable triggers than nonhigh front vowels. As described at length below, that finding is corroborated in my survey of German dialects. Therefore, one of the goals of this book is to consider the extent to which claims made in the typological literature are correct for the velar fronting material from German dialects. Conversely, some of the findings from German dialects cannot be confirmed in the typological works cited above. For example, that literature almost always asserts (or simply assumes) that the fronting of velars is always assimilatory; however, that claim cannot be correct for the German dialects alluded to earlier in which velar fronting occurred in the context of front and back vowels.

1.4.4 Research questions

I have referred to a number of issues and problems that are dealt with in the following chapters, the most important of which are stated below. The questions posed in (8) pertain to the new data described in §1.4.1 and to their interpretation in §1.4.2. The two general typological questions in (9) were described above in §1.4.3. (10) is a very general question of interest to dialectologists. Three of the most significant questions pertaining to the patterning of [x] and [ç] in the synchronic phonology of MoStGm discussed in §1.2 are presented in (11).

(8) a. Targets/triggers: What do the targets and triggers for velar fronting in German dialects tell us about the various stages of the historical rule of velar fronting?
    b. Opacity: How did opaque velars and opaque palatals arise historically? To what extent can that type of opacity help determine when velar fronting was phonologized?
    c. Outputs: What is the historical origin of alveolopalatalization, and how did it spread through time and space?

(9) a. How can the rules relating velar and palatal sounds in German dialects shed light on typological work done on similar rules in other languages?
    b. How can the typological work done on languages fronting velars be applied to velar fronting in German dialects?

(10) How are varieties of German reflecting the various options listed under (8a–c) distributed geographically?

(11) a. What is the correct underlying sound for the rule relating [x] and [ç], i.e. /x/ or /ç/?
b. How does one unite the two categories "front vowels" and "n, l, r" given that [ç] surfaces after a back (dorsal) sound ([ʁ]/[ɐ])?
c. Why does the palatal fricative [ç] in the diminutive suffix -*chen* occur after a back vowel?

Note that question (11a) can also be posed with respect to any German dialect in which velar fronting is active synchronically. (11b) is a specific question that can be subsumed into general questions regarding triggers (in 8a) and opacity (in 8b). Question (11c) can rightfully be extended to German dialects with -*chen*, although, as stressed by Robinson (2001), the question is moot for dialects spoken in the north of Germany (which have some variant of [-kən]) and south of Germany as well as Switzerland and Austria (which have some variant of [-lɑin]). In the present book I restrict my discussion of the status of -*chen* to MoStGm.

1.5 Phonology vs. phonetics

The dorsal segments that form the object of investigation in this work have been referred to above in terms of two discrete place categories, namely "velar" and "palatal"; recall Table 1.1(a). The respective phonetic symbols for those fortis and lenis dorsal fricatives are repeated in (12):

(12)

Velar:	[x]	[ɣ]
Palatal:	[ç]	[ʝ]

The phonetic symbols in (12) express broad phonetic representations, and the terms "velar" and "palatal" are likewise mere names for two phonological categories that could also be labeled "back dorsal" and "front dorsal" respectively.

From the point of view of phonetics the two-way place dichotomy in (12) is simplistic, and some phonological treatments have accordingly adopted additional place categories. Consider first the German sound transcribed broadly as "[x]". Following Kohler (1990b,a), Wiese (1996b: 210–216) observes that the back dorsal is realized as velar ([x]) after nonlow back tense vowels ([uː oː]) and as uvular ([χ]) after low vowels ([ɑ ɑː]). After nonlow back lax vowels ([ʊ ɔ]) there is variation between [x] and [χ], but [χ] predominates. Thus, words like *Dach* 'roof' and *Buch* 'book' can be narrowly transcribed as [dɑχ] and [buːx] respectively. In fact, Wiese sees [χ] as a byproduct of German phonology and not simply phonetics. Hence, he posits – in addition to velar fronting (his dorsal fricative assimilation)

– a rule he dubs "dorsal fricative lowering", which converts velar [x] to uvular [χ] after certain back vowels (Wiese 1996b: 213).

Within the palatal category, it has long been known that the exact place of [ç] differs according to the type of front vowel that precedes it. This point is clear from the palatograms presented over one hundred years ago in Scripture (1902: 309–310), who concluded that the articulation of German [ç] "… varies with the preceding vowel". It is also instructive to consider the findings of Recasens (2013), whose cross-linguistic work (which includes German) identifies four separate zones within the palatal region. No approach to my knowledge has argued that there are different surface realizations of German [ç] created by a phonological rule.

I adopt the position that velar fronting is a phonological rule which relates the two discrete categories in (12). The exact place of articulation for sounds transcribed as "[x]/[ɣ]" and "[ç]/[ʝ]" is a topic that cannot be discussed because the original sources I have consulted typically do not provide such fine-grained distinctions.

It is conceivable that the German dialects discussed below possess both back dorsals ([x] and [χ]) and that the distinction between the two was simply ignored by the linguists describing those dialects. If this plausible scenario were true then my survey of German dialects provides an excellent reason for considering the rules accounting for the distinction between velar and uvular to lie in the domain of phonetics. The reason is that no German dialect is known displaying the same kind of phonologization of [x] and [χ] as described below for [x] and [ç]; e.g. no dialect has uvular quasi-phonemes or a contrast between a velar and a uvular.[6]

The intuition behind the classification in (12) with two discrete categories is reflected in the pronouncing dictionaries (Siebs 1969, Krech 1982, Mangold 2005) and in colloquial speech of modern-day German speakers, who refer the palatal [ç] as the ich-Laut and the velar [x] as the ach-Laut. Significantly, there is no colloquial term for any of the sounds referred to above within either of the two categories in (12). The fact that many grammarians describing German dialects were silent on the distinction between velar vs. uvular or between different palatals suggests that those categories were either not salient enough to be perceived or that the finer-grained distinctions were simply deemed irrelevant.

There has been a very long tradition of classifying German dorsal fricatives in terms of precisely two place categories. To cite the earliest example known

[6]The same reasoning argues against considering the different front dorsal articulations to be phonological. As noted in Table 1.1(b), there are German dialects in which the output of velar fronting is an alveolopalatal (sibilant) fricative [ɕ]. That type of dialect is consistent with the "two-category only" approach endorsed here (see Chapter 10).

to me, George Henry Noehden (1770–1826) includes in his grammar of German an extensive discussion of pronunciation. Consider what Noehden (1800: 62–63) writes of the pronunciation of German *ch*:[7]

> The English language furnishes nothing, with which the sound of this character may be compared …. This sound is twofold guttural, and palatick. The guttural is entirely formed in the throat… and answers … to the Scotch ch, in Loch… also to the Spanish x in dexar, and the j of the same, in lejos. The German ch … takes place, when joined to the vowels a, o, u, and the diphthong au. Examples: ach, alas! Das Dach, the roof, noch, yet; das Joch, the yoke; hoch, high; das Buch, the book … The palatick sound arises from a strong appulse of the breath against the palate, and is assigned to ch, when in conjunction with e, i, ä, ö, ü, äu. Examples: der Hecht, the pike, schlecht, bad, das Licht, the light ….

In an era in which the difference between sounds and letters was far from obvious, it is remarkable that Noehden was not only aware of the fact that there are exactly two sounds represented by (postvocalic) *ch* – in his words "guttural" and "palatick" – but also that the choice of one or the other depended on the type of preceding vowel.

Noehden's intuition that there are exactly two categories of dorsal sounds is not an isolated example from that general time frame. In fact, it is more the rule than the exception for nineteenth and early twentieth century handbooks dealing with German grammar to recognize exactly two discrete categories among dorsal fricatives. Examples include works written in English on both sides of the Atlantic (e.g. Follen 1828: 7 published in Boston, and Sweet 1877: 134–135, published in Oxford), and in German (e.g. Trautmann 1884–1886: 281, Sievers 1885: 61–62, Wilmanns 1893: 5, Hempl 1898: 121–122, Viëtor 1901: 22, Behaghel 1902: 197, and Sütterlin 1907: 28). Significantly, many of those handbooks were known to the authors of the Ortsgrammatiken I cite. See the quote by Robert Murray in §1.1 and the description of the kind of original sources employed in the present book in §1.6.

The "front dorsal" vs. "back dorsal" approach to the sounds in (12) may well be the dominant one these days, but a bit more needs to be said about an alternative

[7] Voge (1978: 113) cites several works written in the last quarter of the eighteenth century which apparently recognize that *ch* represents both [ç] and [x], but the passages he cites are not nearly as transparent as the one from Noehden. What is more, Noehden's book was more influential than the late eighteenth century sources because it was often cited in scholarly works published throughout the course of the nineteenth century.

tradition – similar to the one championed by Wiese (1996b) – which endorses a third place of articulation among dorsal sounds. The three-way place approach referred to here has its roots in late nineteenth century Ortsgrammatiken. One representative of this tradition is Batz (1911), who provides a detailed description of the EFr dialect spoken in Bamberg (Map 4). In the section on the pronunciation of consonants, Batz (1911: 16) has an ach-Laut (articulation on the soft palate), an ich-Laut, (articulation on the hard palate) and an öch-Laut (articulation between the hard and soft palate). Essentially the same type of classification has been adopted more recently by a number of linguistic atlases I cite in this book (see §1.6.2). For example, the six parts of the *Bayerischer Sprachatlas* each have a "palatal" and a "velar" category, as well as a place of articulation akin to Batz's öch-Laut which lies between the two. Those atlases consequently provide a number of very detailed maps of phonetically transcribed German words which include distinct symbols for three places of articulation among dorsal fricatives.

Given that a major goal of linguistic atlases is to document fine-grained differences in pronunciation in different regions, it is hardly surprising that the two-way place distinction in (12) is usually rejected. The six parts of the *Bayerischer Sprachatlas* consequently all provide a wide array of phonetic symbols and diacritics in order to give very narrow transcriptions which account for subtle distinctions among vowel qualities (e.g. multiple vowel heights defined in terms of degrees of openness), vowel quantity (long vs. short vs. half-long), and laryngeal dimensions (lenis vs. fortis vs. categories between the two). A three-way place distinction among dorsal sounds is therefore precisely what one would expect given the goals of linguistic atlases.[8] *Bayerischer Sprachatlas*. The first is *Atlas zur Aussprache des Schriftdeutschen in der Bundesrepublik Deutschland* (AAS), which posits five distinct places of articulation for dorsal fricatives (Volume 1: 97–99). AAS even makes the strong claim that the distribution of those five phonetic variants are defined geographically (Maps CH.1 and CH.2 in Volume 2). AAS is outdone by *Atlas zur Aussprache des deutschen Gebrauchsstandards* (AADG), which has six distinct places of articulation for the back dorsal (ach-Laut) and five for the front dorsal (ich-Laut). As in AAS, AADG shows that these articulations have geographic preferences.

In contrast to tradition among linguistic atlases, my treatment of velar fronting does not require reference to fine-grained distinctions. In fact, I claim that this kind of detail would obscure the synchronic and diachronic treatment I propose below. But there is a much more straightforward reason for restricting my

[8] I am familiar with two atlases which even go beyond the narrow transcriptions for dorsal fricatives in the

treatment of German dialects to the two place categories in (12): The vast majority of original sources for German dialects do even not mention a third dorsal place, let alone the multiple places proposed in AAS and AADG (Map 8). Thus, any attempt to document velar fronting in all of the dialect areas depicted on Figure A.1 which takes more than two places of articulations for dorsal sounds into consideration would not be realizable.

1.6 Data and sources

The German dialect data introduced below comprise etymologically native words (as in 5 and 6), although occasionally older loanwords which are fully integrated into the language are included as well. Loanwords containing velars and/or palatals (e.g. *Chemie* 'chemistry' in 3b) are not considered because most of the sources do not discuss them. That point aside, the status of dorsal fricatives in word-initial position in examples like *Chemie* is controversial even in MoStGm; see Appendix G for discussion. There are three types of sources I draw upon, which are discribed in the following three subsections.[9]

1.6.1 Ortsgrammatiken

The data discussed and analyzed below have been drawn from a wide variety of works dealing with a geographically-diverse selection of German dialects spoken roughly over the last one hundred forty years. Some of those studies are recent dissertations and theoretical articles based on data drawn from introspection or phonetic analysis, but the bulk of the work cited below comes from descriptive grammars of German dialects. Much of this work fits into the tradition of German dialectology known as Ortsgrammatiken, which were written in German-speaking countries during or shortly after the Neogrammarian (Junggrammatiker) era. The reader is referred to Murray (2010) for discussion.

It is important to stress that the basic method adopted in this book has been common for several decades among specialists of German. One example from the mid-twentieth century is Schirmunski's (1962) lengthy survey of German dialects, which is based on data from Ortsgrammatiken. Other noteworthy examples include Wiesinger's (1970a, 1970b) tomes on German vowels and Howell's (1991) monograph on Breaking in early Gmc. More recently, Goblirsch (2018)

[9] I do not discuss the well-known questionnaires developed by the late 19th century linguist Georg Wenker (Wenkerbogen), although data from those questionaires are included in some of the phonetically-transcribed texts I discuss below in §1.6.3.

makes extensive reference to original descriptions of German dialects in his study of the history of quantity in Gmc, and Caro Reina (2019) draws on data from the same type of sources in his phonology of Swb.

It is also worth emphasizing that my approach of investigating small differences in closely-related dialects has a precedent in linguistics, where there is an entire field devoted to MICROVARIATION. See Brandner (2012) for an overview of microvariation in syntax and Alber (2014), who extends this approach to phonology. Microvariation applies theoretical concepts of modern generative theory to dialectal and small-scale variation, and – in doing so – it bridges the gap between traditional studies in dialectology – Ortsgrammatiken in the present context – and formal theory. Seen in this light, the present book fits into a broader contemporary enterprise involving the application of formal theory to linguistic data involving small-scale variation in German dialects.

Since many readers may not be familiar with the Ortsgrammatik tradition, I provide some background on that type of source. The typical Ortsgrammatik consists of an in-depth description of a single locality considered to be relatively homogeneous and therefore free of dialect mixture. As pointed out by Murray (2010: 80), the grammars are usually written by phonetically well-trained native speakers grounded in the Junggrammatiker tradition who employ both self-analysis and fieldwork. Most of these Ortsgrammatiken have both a synchronic and a diachronic component emphasizing the phonetics and the inflectional morphology of the dialect in question. Given the general time frame of these sources it is understandable that the synchronic discussion of sound structure involves only phonetics and not phonology (e.g. the notion of the phoneme and allophones).

Many of the dialects described in the Ortsgrammatiken referred to above – especially those in the north of pre-1945 Germany – are moribund due to evacuation and forced expulsion of Germans from East Prussia (Ostpreußen), Silesia (Schlesien) and East Pomerania (Ostpommern) after 1945. Certain dialects in Northwest Germany in regions never subject to forced expulsion are nevertheless either extinct or on the verge of extinction.

There is more than one reason why it is essential to investigate the sound structure of German dialects spoken a century ago. First, as noted above, many varieties are simply no longer spoken; hence, older descriptions of those dialects are often the only sources we have available. Second, a number of older dialects often preserve structures that are absent in dialects spoken in the present day. The type of dialect referred to here can therefore be thought of as a missing link without which a complete understanding of velar fronting would not be possible.

An investigation of dialects spoken in the late nineteenth and early twentieth century has an added advantage. Dialects described a century ago were written at a time when the influence of the standard language on dialects was minimal because the notion of a standard language had not yet established itself. Anyone conducting fieldwork on modern German dialects can attest to the fact that it is difficult if not impossible to find dialect speakers who have no knowledge at all of the standard language. Hence, velar fronting in many German varieties spoken today may not truly reflect velar fronting in that particular dialect, but instead velar fronting in MoStGm. By contrast, dialect speakers with little or no knowledge of MoStGm were more common a century ago and could therefore give an accurate picture of velar fronting in their respective dialects.

I only cite sources which include enough data to draw conclusions regarding the issues mentioned above (e.g. the set of triggers and targets as well as opaque segments). Hence, I eschew sources in which not enough data are presented to determine the correct distribution of velars and palatals or sources in which the data involving the distribution of velars and palatals are simply unclear. As a general rule I prefer sources which express the difference between velars and palatals with distinct phonetic symbols. In certain exceptional cases I incorporate data in which a single phonetic symbol is used to distinguish two articulations (e.g. [x] vs. [ç]), but only if that source is clear on the distribution of those sounds.

An objection to data from older works often raised is that those sources may not be trustworthy. In fact, I see several reasons for considering the older sources cited here to be highly reliable in their descriptions of the sounds investigated below. Consider the following:

Phonetically-trained authors: It is my experience that many linguists in the present day are reluctant to accept data drawn from older sources even if those individuals have never even laid eyes on such works. Those skeptics apparently believe that writers in the late nineteenth and early twentieth century simply did not know enough about sound structure to give an accurate portrayal of the phonetics. That belief is mistaken, at least in the case of the German dialect literature cited below, because the descriptive works referred to here were written by linguists trained in the Neogrammarian tradition who had a thorough grounding in phonetics. Hence, all of the authors cited below were well-aware of the classification of consonants (e.g. in terms of place, manner) and vowels (e.g. in terms of height and backness etc). All of the older sources cited – without exception – were intimately acquainted with the distinction between "velar" and "palatal" depicted in (12) – recall §1.5 – and consequently transcribed those articulations with distinct phonetic symbols.

Confirmation from multiple sources: The pattern whereby velars like [x] are fronted in the context after all front vowels is uncontroversial in MoStGm as well as some of the modern dialects discussed below. If a source written in the year 1880, for example, tells us that there is a small community in which [x] is fronted after all front vowels and not after other sounds then it is difficult to conclude that the source should be deemed untrustworthy. A similar point holds for sources describing a pattern distinct from the one exemplified by MoStGm. For example, if three authors write independently from one another during the same general time frame that there are places in three separate regions separated by hundreds of kilometers in which historical [x] is realized as [ç] in the context of front vowels but not in the context of coronal consonants like [n l r], then the most reasonable assumption is that the three descriptions are accurately describing the triggers for velar fronting in their respective community.

Consistent transcriptions: The sources cited in the present book are remarkably consistent in their transcriptions of velars and palatals. For example, many authors observe that historical [x] is fronted to [ç] after certain vowels (e.g. [i e]) and remains [x] after others (e.g. [u o ɑ]) but that etymological [ɣ] remains [ɣ] after any vowel. That descriptive claim derives support from a plethora of examples in which [ç] occurs precisely after [i e] and nowhere else, [x] exclusively after [u o ɑ], and [ɣ] after [i e u o ɑ], but what is remarkable is that there are no deviant lexical items that might suggest the author has missed those generalizations. If the source were unreliable then one might expect there to be inconsistencies and/or errors obscuring the general pattern thereby casting doubt on the competence of the author. Such inconsistencies might involve [ç] being occasionally transcribed after sounds other than [i e] or [x] after sounds other than [u o ɑ]. Likewise, in an unreliable source the velar [ɣ] might occasionally be transcribed as palatal [ʝ] after front vowels, thereby causing one to question the claim that velar [ɣ] surfaces even after front vowels. The most reasonable conclusion is that [x] is the sole target for velar fronting and that the triggers consist of all and only front vowels. The same point holds for dorsal segments with an unexpected distribution, i.e. opaque sounds. For example, many writers have observed that velar fronting of historical [ɣ] to [ʝ] occurred in word-initial position before front vowels or schwa ([ə]) but elsewhere stays [ɣ]. In the type of grammar referred to here one might see dozens of words beginning with [ʝ] before a front vowel or schwa and [ɣ] before other sounds, but sequences like [ɣə] are absent.

Linguistically plausible data: In virtually all of the sources cited below the conditions under which velars undergo fronting correspond to natural classes in phonology. What is more, those natural classes usually support findings from typological research referred to in §1.4.3. Those natural classes are almost never explicitly identified in the respective sources as such (since the concept did not exist at the time), but they are evident from the list of segments given that undergo or induce velar fronting. For example, multiple descriptive grammars attest to the realization velars as palatals after vowels like [i ɪ e ɛ] but not after [u ʊ o ɔ ɑ] or [æ]. Instead of considering the source to be untrustworthy a more likely explanation is that authors are describing the fronting of velars after nonlow front vowels. By contrast, an unreliable source might give a list of vocalic triggers that is completely arbitrary, e.g. after [i e ɛ o] but not after [ɪ u ʊ ɔ ɑ æ]. None of the sources cited below document that kind of bizarre context for velar fronting.

1.6.2 Linguistic atlases and dialect dictionaries

In addition to Ortsgrammatiken, I draw on some data from the linguistic atlases presented in Table 1.2. There are a number of excellent regional atlases (Kleinraumatlanten) for German dialects, several of which are included here. See Scheuringer (2011) for a survey of linguistic atlases for German dialects.

As suggested by the names listed in the first column, most of the atlases focus on a particular region or dialect area: ACeM for the area in northern Germany around the city of Celle, AGSM for Swabian, ALA for Alsace, ALLG for German Lorraine (Deutsch-Lothringen), LSA for Luxembourg, NOSA for North Germany, SchlSA for Silesia, SNBW for the northern part of the German state of Baden-Württemberg, SAO for Upper Austria, SDA for the Sudetenland (Czech Republic), SDS for German-speaking Switzerland, SSA for Southwest Germany, ThürDA for Thuringia, TSA for Tyrol, VALTS for Vorarlberg, Liechtenstein, West Tyrol, and the Allgäu, WSAH for the German state of Hesse, and ZFSA for German-language islands of Northeast Italy (Cimbrian and Fersentalerisch). MRhSA concerns itself with the central and southern region of the Rheinischer Fächer (=Rhenish Fan). Six atlases listed above (SBS, SMF, SOB, SNiB, SNOB, SUF) are separate parts of the *Bayerischer Sprachtlas*, which covers most of Bavaria (Freistaat Bayern). One of the atlases listed above (KDSA) has as its focus all German-speaking countries given pre-1918 borders. The four works listed in Table 1.2 which do not concern themselves specifically with German dialects are AADG, AAS, ADA, and WDU. Those works investigate regional differences in the pronunciation of contemporary German (AADG), the pronunciation of the written

Table 1.2: Linguistic atlases and their abbreviations

Atlas name	Abbreviation
Atlas zur Aussprache des deutschen Gebrauchsstandards	AADG
Atlas zur Aussprache des Schriftdeutschen in der Bundesrepublik Deutschland	AAS
Atlas der Celler Mundart	ACeM
Atlas zur deutschen Alltagssprache	ADA
Atlas linguistique et ethnographique de l'Asace	ALA
Atlas linguistique et ethnographique de la Lorraine germanophone	ALLG
Atlas zur Geographie der schwäbischen Mundart	AGSM
Kleiner Deutscher Sprachatlas	KDSA
Luxemburgischer Sprachatlas	LSA
Mittelrheinischer Sprachatlas	MRhSA
Norddeutscher Sprachatlas	NOSA
Schlesischer Sprachatlas	SchlSA
Sudetendeutscher Atlas	SDA
Sprachatlas der deutschen Schweiz	SDS
Sprachatlas von Bayerisch-Schwaben	SBS
Sprachatlas von Mittelfranken	SMF
Sprachatlas von Oberbayern	SOB
Sprachatlas von Niederbayern	SNiB
Sprachatlas von Nordostbayern	SNOB
Sprachatlas von Unterfranken	SUF
Sprachatlas von Oberösterreich	SAO
Sprachatlas von Nord Baden-Württemberg	SNBW
Südwestdeutscher Sprachatlas	SSA
Thüringischer Dialektatlas	ThürDA
Tirolischer Sprachatlas	TSA
Vorarlberger Sprachatlas	VALTS
Wortatlas der deutschen Umgangssprachen	WDU
Wortgeographie der städtischen Alltagssprache in Hessen	WSAH
Zimbrisch und fersentalerischer Sprachatlas	ZFSA

language (AAS), and colloquial speech (ADA, WDU).

Data from linguistic atlases are important because they make it possible to look at general patterns that might not be evident in the Ortsgrammatiken. They are also very useful because they sometimes indicate places within a broad region with the kinds of quirks regarding targets and triggers for velar fronting described above.

In this book I also make some reference to dictionaries on specific dialects. I only consider those dialect dictionaries which either contain phonetic transcriptions in lexical entries or which provide a clear statement concerning pronunciation. The dialect dictionaries I cite in this book are provided in Table 1.3, which are listed alphabetically according to the abbreviations in the second column.

It can be seen that some dictionaries focus on a particular city (AaWb, DoWb, DrWb, HaWb, KWb, NKSS, NSSS, SbWb, TrWb, WbKM), state (SchlHWb), former province (PWb), former county (TeWb), region (MiElWb, RWb, SiWS, TiWb, WbUS, WMlWb), or dialect area (ObersWb, SchwWb, SHesWb, WphWb).

Like linguistic atlases, dialect dictionaries are important for identifying broad patterns representing a particular geographic region that might not be evident in Ortsgrammatiken.

1.6.3 Phonetically transcribed texts

Considerable work on German dialects consists of phonetically transcribed texts of native speakers for a dialect spoken in a particular place. These texts might be the transcription of a conversation or the recitation of a story or fairy tale. They are also often accompanied by a written commentary. The type of phonetically transcribed text referred to here can be found in the book series *Lautbibliothek der deutschen Mundarten* (until 1969) and the successor book series *Phonai*. Several works cited in the following chapters appeared in either one of those series. Another type of phonetically-transcribed text can be found in the realm of morphology. A number of works have appeared through the years on various aspects of the morphological structure of German dialects, e.g. noun declensions, verb conjugations. That type of work can be drawn upon as evidence of velar fronting for a particular place if distinct symbols are employed for velars and palatals.

If the phonetically transcribed text is long enough then it is possible to draw conclusions on the status of velar fronting. These texts are particularly useful if neither *Ortsgrammatiken* nor linguistic atlases are available for a particular area.

Table 1.3: Dialect dictionaries and their abbreviations

Dictionary name	Abbreviation
Aachener Wörterbuch	AaWb
Dortmunder Wörterbuch	DoWb
Dremmener Wörterbuch	DrWb
Hamburgisches Wörterbuch	HaWb
Das Kölsche Wörterbuch	KWb
Mittelelbisches Wörterbuch	MiElWb
Wörterbuch der obersächsischen und erzgebirgischen Mundarten	ObersWb
Neuer Kölnischer Sprachschatz	NKSS
Neunkirchen-Seelscheider Sprachschatz	NSSS
Pommersches Wörterbuch	PWb
Rheinisches Wörterbuch	RWb
Saarbrücker Wörterbuch	SbWb
Schleswig-Holsteinisches Wörterbuch	SchlHWb
Schwäbisches Wörterbuch	SchwWb
Südhessisches Wörterbuch	SHesWb
Simmentaler Wortschatz	SiWS
Wörterbuch der Teltower Volkssprache	TeWb
Wörterbuch der Tiroler Mundarten	TiWb
Trierer Wörterbuch	TrWb
Wörterbuch der Kölner Mundart	WbKM
Wörterbuch der unteren Sieg	WbUS
Wörterbuch der westmünsterländischen Mundart	WMlWb
Wörterbuch der westphälischen Mundart	WphWb

1.7 Structure of the book

The remainder of this book consists of seventeen chapters, which are summarized briefly here. Chapter 2 introduces the theoretical underpinnings adopted in my investigation of velar fronting. That chapter includes a description of features for consonants and vowels in order to state the various versions of velar fronting in a theoretically consistent fashion, an explication of opacity, a summary of velar fronting in the context of work done on the typology of similar rules fronting velars, and a sketch of the historical model delineating the various stages of velar fronting described above.

The core of the book (Chapters 3–15) consists of detailed datasets from original sources involving velar fronting in HGm/LGm varieties and my analysis thereof. Those chapters are organized for the most part structurally and not according to geography in the following way:

In Chapters 3–4 I discuss dialects in which [x] and [ç] exhibit a transparent (allophonic) relationship. The former chapter concerns itself with those varieties in which velar fronting relates the two fortis sounds [x] and [ç]. Case studies are provided for dialects spoken in southern Germany, Switzerland, and Austria. Chapter 4 probes a set of dialects containing the lenis velar fricative [ɣ] and/or the lenis palatal fricative [ʝ] in addition to [x] and [ç]. The dialects investigated consist of primarily moribund varieties once spoken in northern Germany.

Chapters 5–9 investigate opacity. Chapters 5–6 consider underapplication and Chapters 7–9 overapplication. In Chapter 5 I discuss German dialects spoken in central Germany in which some independent synchronic rule creating [x] counterfeeds velar fronting, and in Chapter 6 I consider neutral vowels with data drawn from two varieties of SwGm.

Chapter 7 investigates a number of varieties not restricted to a particular region which have in common that they possess palatal quasi-phonemes. Chapters 8–9 concern themselves with phonemic palatals that contrast with the corresponding velars. In Chapter 8 I discuss dialects spoken in northern Germany in which phonemic palatals surface word-initially and in Chapter 9 I discuss dialects spoken in central Germany with phonemic palatals in postsonorant position.

Chapter 10 is devoted to an investigation of dialects spoken in central Germany in which the post-front vowel palatal [ç] is replaced with alveolopalatal [ɕ]. It is demonstrated that [ɕ] is an allophone of /x/ in some varieties but that in others [ɕ] contrasts with [x]. I show that alveolopalatalization does not involve opacity.

Chapter 11 investigates German dialects in which the set of targets for velar fronting include velar stops and the velar nasal (recall 7d,e and 8c,d). Those varieties were once spoken in the northeast of pre-1945 Germany.

Chapter 12 summarizes the findings in chapters 3–11 on the extent to which triggers and targets for velar fronting can vary from place to place.

Chapter 13 discusses data from a linguistic atlas for Lower Bavaria (SNiB) which document velar fronting throughout that area. An important conclusion of that chapter is that velar fronting is not uniform in Lower Bavaria. Instead, there are three versions of the rule defined according to the nature of the triggers.

Chapter 14 investigates the nonassimilatory fronting of velars.

Chapter 15 documents velar fronting islands and discusses the extent to which the segments inducing that process (triggers) can differ from place to place.

Chapter 16 demonstrates how linguistic evidence can shed light on how velar fronting fits into the well-established stages in the history of German (Appendix E). In that chapter I also consider how data from modern dialects can give evidence regarding the areas where velar fronting has been active the longest.

Chapter 17 considers the status of velar fronting in MoStGm and addresses the research questions in (11).

Chapter 18 provides a brief conclusion in which I summarize my findings and relate those findings to the research cited earlier.

This book contains supplemental information in the form of twelve appendices. Appendix A provides the reader with an overview of HGm and LGm dialects and also includes a map indicating the distribution of those dialects in German-speaking countries in pre-1914 Europe. Appendix B is a historical map depicting the German Empire during the time frame 1871–1918. Appendix C lists tables containing all varieties of German (including sources) investigated and classifies those varieties in terms of the dialects given in Appendix A. Appendix D gives a list of the triggers and targets for all versions of velar fronting posited in the present book. Appendix E is a family tree for Gmc languages. Appendix F provides some background information on the historical reflexes of modern-day dorsal fricatives in German dialects. Appendix G concerns itself with the status of dorsal fricatives in loanwords in MoStGm and other varieties. Appendix H gives the inventory of consonants and glides in three broad dialects (LGm, CGm, UGm). Appendix I provides some discussion of the status of velar fronting (palatalization) in the branches of Gmc not discussed in this book, in addition to the language families spoken in the immediate vicinity of the German-speaking world, namely Slavic and Romance. Appendix J lists the names of all 221 villages, towns, and cities where data were drawn from the linguistic atlas for Lower Bavaria (SNiB). Appendix K and Appendix L list the linguistic atlases and dialect dictionaries cited throughout this book.

2 Theoretical background

2.1 Introduction

The goal of this chapter is to introduce the formal models of phonology and phonological change I adopt in this book and to discuss the findings in the typological research as they relate to velar fronting. §2.2 makes explicit several assumptions involving levels of grammar, features for consonants and vowels, and opacity. §2.3 gives a synopsis of some of the findings in the typological work on velar palatalization, and §2.4 presents models of historical phonology and lays out some underlying assumptions concerning historical phonology. The diachronic model for velar fronting defended in the present book is described in detail in §2.5.

2.2 Phonological models

My treatment of velar fronting in German dialects presupposes a model of grammar in which phonetics and phonology are two separate components. That model is described in §2.2.1. Since velar fronting is typically assimilatory, it is essential to adopt a theoretical framework that is able to express the correct triggers and targets for that process. To achieve that end I adopt a model of features described in §2.2.2 (for consonants) and §2.2.3 (for vowels). §2.2.4 defines the different types of rule interaction discussed in the ensuing chapters (e.g. transparent vs. opaque; underapplication vs. overapplication). That discussion provides the necessary background in order to understand the way in which velar fronting interacts with independent processes that create and eliminate potential targets and triggers.

2.2.1 Levels of grammar

I follow earlier authors in the generative tradition who posit an architecture of grammar consisting of more than one representational level (e.g. Chomsky & Halle 1968 and subsequent work by many authors). I adopt the model in Table 2.1, which is similar to the ones presupposed by other writers (e.g. Keating 1990, Cohn 1993, Keating 1996, Hale et al. 2015, Bermúdez-Otero 2015).

As indicated in Table 2.1, the input to the phonology is the underlying representation (enclosed in diagonal slashes: / … /). By definition the underlying representation contains the stored forms of morphemes or sequences of morphemes in morphologically-complex words. The segments present in underlying representation (expressed throughout this book with IPA symbols) are mere abbreviations for bundles of distinctive features (§2.2.2 and §2.2.3).

Table 2.1: Representational levels

/ … /	Underlying representation
	Phonology
[…]	Phonetic representation
	Phonetics
…	Speech

Phonology (=phonological component) is the mapping of underlying representations to phonetic representations (enclosed in single square brackets: […]). Representations in the phonology consist of the same set of units (=features) necessary to express the underlying representations. Complete phonological representations also require prosodic constituents such as syllables and feet as well as association lines connecting those units with one another and with the features.

Words in the phonetic representation consist of the same phonological units described above, e.g. features, syllables, feet. There are no units required for the phonetic representation that are not present in the underlying representation or in the phonology. The representational alphabet for the phonetic representation is therefore the same for the underlying representation and for the phonology.

The change from underlying representations into phonetic representations via the phonology takes the form of phonological rules, although the mapping described here is also consistent with an Optimality Theoretic approach with constraints instead of rules (Prince & Smolensky 2004).

The Phonetics component in Table 2.1 is the locus of phonetic rules, which are characterized by gradient outputs. By contrast, phonological rules are categorical. According to Keating (1990: 452), “Phonetic rules can thus, for example, assign a segment only a slight amount of some property, or an amount that changes over time during the segment”.

I assume two types of phonetic rules, namely COARTICULATION and PHONETIC IMPLEMENTATION. The two terms are used in the literature in slightly different ways. For my purposes I define them as follows:

Coarticulation is the overlapping of adjacent articulations. For example, Cohn (1993) demonstrates that vowels in English are gradiently nasalized before nasal consonants, e.g. the /i/ in *dean* (/din/). In that example nasal airflow on the vowel gradually increases throughout the duration of that vowel, thereby indicating that the velum lowers not at once, but instead over the course of the vowel. That type of gradient coarticulatory nasalization can be contrasted with phonological vowel nasalization in other languages, in which the vowel is nasal over its entire duration (categorical).

Phonetic implementation is responsible for the interpretation of low-level distinctions that play no role in the phonology. Consider the following examples involving manner and place of articulation of consonants: The one rhotic phoneme – present in all German dialects – surfaces initially in items like *rot* 'red' in a number of different ways, e.g. approximant, trill. The inter- and intraspeaker variation pertaining to those manner categories is determined not in the phonology but instead in the phonetics by rules of phonetic implementation. Hence, the phonological representation of the rhotic consists of a set of distinctive features described in §2.2.2 which make no reference to categories like "approximant" or "trill". Phonetic implementation is also necessary to express the exact place of articulation of sounds like /t/ and /d/. As demonstrated below in §2.2.2 the phonology specifies that /t/ and /d/ bear the distinctive feature referring to an articulation with the front part of the tongue ([coronal]) to distinguish them from labials (/p b/) and velars (/k g/). However, the realization of /t d/ as dental or alveolar is determined by rules of phonetic implementation.

The level of grammar referred to in Table 2.1 as "Speech" is intended to express the actual phonetic realization of the word in question. Seen in this light, Speech requires a conversion of the nature of objects involved because the underlying representation, the phonology and the phonetic representation utilize phonological units such as features, association lines and prosodic constituents, but the phonetic realization of those abstract representation involves the actual organs of Speech. Thus, a phonetic representation is converted into both an articulatory act involving a coordination of muscles in the jaw, throat and lungs, as well as an acoustic output consisting of sound waves.

The example discussed in Hale et al. (2015) illustrating Table 2.1 is the English word *keep*, which has the underlying representation /kip/, where those three segments represent three distinct feature bundles. The /k/ in /kip/ undergoes a phonological rule of Aspiration, which produces the phonetic representation [kʰip]. The phonetic representation [kʰip] is expressed in terms of phonological units, but its actual articulatory and acoustic realization (=Speech) requires reference to factors such as the exact place of contact between the tongue body and the roof of the mouth and the length in terms of milliseconds of the release of the closure of the velar stop until the onset of voicing of the following vowel.

The phonological component in Table 2.1 is often argued to be subdivided into domains of various sizes to which rules are assigned. For example, in the model of Lexical Phonology and Morphology (e.g. Kiparsky 1982b, Kaisse & Shaw 1985, Mohanan 1986, Hargus & Kaisse 1993) phonological rules can apply across words (postlexical rules) or within words (lexical rules). In Stratal Optimality Theory (Kiparsky 2000, Rubach 2000, Kaisse & McMahon 2011, Bermúdez-Otero 2015) a distinction is drawn between phrase level, word level, and stem level rules.

An example of a phrase level rule is Flapping in American English, which is responsible for the realization of /t d/ as [ɾ] both word-internally (e.g. *ci[ɾ]y*) and across words (e.g. *si[ɾ] in a chair*). Stem level rules only apply within words. They show alternations triggered by certain suffixes (stem level suffixes) but not by others (word level suffixes). For example, in English the rule of Trisyllabic Laxing creates a lax vowel in the antepenultimate syllable in words like ***na**tional* (vs. ***na**tion*) but not in words like ***na**tionhood*. Trisyllabic Laxing applies in *national* but not in *nationhood* because *-al* is a stem level affix but *-hood* is a word level affix. Word level rules are similar to stem level rules in the sense that they never apply across words. Within words they are triggered only by word level affixes. For example, the English rule of n-Deletion which eliminates /n/ after another nasal applies in *damning* (from /dæmn-ɪŋ/) because *-ing* is a word level affix, but not in *damnation* ([dæmneiʃən]), which contains the stem level affix *-ation*.

The distinction between the three types of domains described above does not play a role in my treatment of velar fronting. See §5.5.1 and especially §12.8.2 for discussion.

All of the authors cited in the present section adopt the basic premise that there is a fundamental difference between phonology and phonetics. A few of the properties characterizing those two components (Bermúdez-Otero 2015) are listed in Table 2.2.

2.2.2 Featural representations for consonants and glides

The most important consonants investigated below are velars because those sounds – or a subset thereof – serve as targets for velar fronting. Velar fricatives (/x ɣ/), velar stops (/k g/) and the velar nasal (/ŋ/) all bear the place feature [dorsal], as in (1)a-c. In contrast to velars, palatals are phonologically complex segments in

Table 2.2: Phonetics vs. phonology

Component	Properties
Phonology	discrete phonological objects (e.g. segmental features, prosodic nodes, association lines)
Phonetics	continuous phonetic dimensions (e.g. formant frequencies, gesture amplitudes and durations)

the sense that they are [coronal] and [dorsal]; see (1d).[1] A representation like the one in (1d) is defended by Robinson (2001) and Hall (2014a). The branching structure depicted here holds for all palatal segments, regardless of manner, i.e. palatal stops (/c ɟ/), palatal fricatives (/ç ʝ/), the palatal nasal (/ɲ/), and the palatal glide (/j/). Manners of articulation (e.g. stop vs. fricative vs. nasal vs. liquid) are expressed with the major class features [±cons(onantal)], [±son(orant)] and the manner features [±cont(inuant)], [±nas(al)].[2] The place features are privative and all other features binary, although that assumption is not justified here because my analysis does not crucially depend on that approach.

(1) a. $\begin{bmatrix} +\text{CONS} \\ -\text{SON} \\ +\text{CONT} \end{bmatrix}$ | [DORSAL]

b. $\begin{bmatrix} +\text{CONS} \\ -\text{SON} \\ -\text{CONT} \end{bmatrix}$ | [DORSAL]

c. $\begin{bmatrix} +\text{CONS} \\ +\text{SON} \\ +\text{NAS} \end{bmatrix}$ | [DORSAL]

[1] The place features depicted in (1) ([coronal], [dorsal]) are present on velars and palatals in all dialects discussed below with the exception of two SwGm varieties (Chapter 6). In those two dialects, [dorsal] in the representation of velars and palatals is argued to be replaced with [peripheral]; see Rice (1994) for the latter feature. (1d) can be contrasted with the proposal based on cross-linguistic work that palatal fricatives are simplex coronals (Hume 1994) or simplex ([−back]) dorsal sounds (Hall 1997). Since a comparison of those approaches with (1d) is given elsewhere (e.g. Hall 2014b,b), I do not discuss this debate here.

[2] Segments playing a minimal role in the following chapters are [labial] sounds like /p b f v/ and [coronal] sounds such as /t d s z ʃ ʒ/. In many approaches to features (e.g. Sagey 1986, Clements & Hume 1995, Hall 1997) alveolar and postalveolar [coronal] sounds (/s z/ vs. /ʃ ʒ/) are distinguished with the feature [±anterior], while Hall (1992) and Wiese (1996b) argue on the basis of MoStGm that it is the feature [±high]. In the majority of case studies discussed in Chapters 2–9 the choice between [±anterior] and [±high] is not significant. The structure of postalveolar sounds like /ʃ/ is shown to be relevant to velar fronting in the context of alveolopalatalization discussed in Chapter 10.

d. …

CORONAL DORSAL

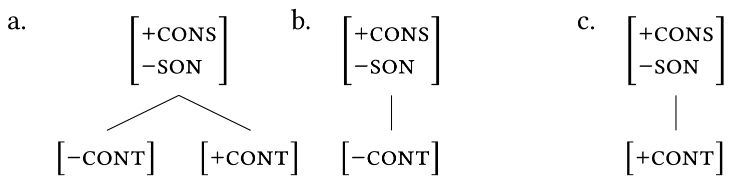
I henceforth adopt an abbreviatory convention whereby all features other than [labial], [coronal], and [dorsal] are listed in the topmost matrix (root node); hence, separate nodes relating to manner and/or laryngeal dimensions are not necessary. I similarly omit the place node for simplicity.

I follow earlier research which draws a distinction between underlying (phonemic) glides and derived glides (e.g. Levi 2004, Hall 2017 and literature cited therein). Underlying glides are transcribed henceforth with distinct phonetic symbols, i.e. /j/ is the underlying palatal glide and /w/ is the underlying labial glide. Of those two sounds the former is more important than the latter because it has a close synchronic and diachronic relationship with the sounds produced by velar fronting (palatal fricatives). The underlying palatal glide /j/ has the place structure depicted in (1d). It is distinct from the homorganic vowel /i/, palatal fricatives, and the palatal nasal with the major class/manner features referred to above; thus, /j/ (and /w/) are [+consonantal, +sonorant, −nasal]. Derived glides are the nonsyllabic components of diphthongs, which are often transcribed with the subscript arch in a narrow phonetic transcription, e.g. [au̯] and [ai̯]. Those glides are (synchronically) derived from the corresponding vowels in the sense that their nonsyllabicity is a function of sonority (Hall 2017). I refrain from making use of the subscript arch in diphthongs and simply transcribe diphthongs as a sequence of two distinct vowel symbols, e.g. [au] (/au/), [ai] (/ai/). Both of the components in diphthongs are [−consonantal]; see §2.2.3.

In many languages there is a contrast between a sibilant fricative and a nonsibilant fricative (e.g. /s/ vs. /θ/ in English), which is traditionally captured with the feature [±strident]. That type of contrast is absent in all of the dialects investigated in the present book; hence, [±strident] is not a distinctive feature and therefore plays no role in the phonology. The implication is that segments such as /s z ʃ ʒ/ have phonological representations consisting solely of the features described above and that the realization of those sounds as sibilants at the level of Speech is expressed with dialect specific rules of phonetic implementation (§2.2.1). The relevance of that type of rule of phonetic implementation for the topic of velar fronting is discussed in Chapter 10.

Most of the dialects discussed below have a laryngeal contrast among stops and fricatives (e.g. fortis /s/ vs. lenis /z/). In a subset of those varieties, that laryngeal contrast also holds for velar sounds, i.e. fortis /x/ vs. lenis /ɣ/. A distinctive laryngeal feature is required for that type of system, which I express with the descriptive cover feature [±fortis], e.g. /x/ is [+fortis] /ɣ/ is [−fortis]. It is assumed here that dialects in which /x/ is the only velar fricative (e.g. MoStGm) do not mark that fricative with the feature [+fortis] because [±fortis] is not distinctive for dorsal fricatives.[3]

Velar and palatal affricates have the same place structure depicted above in (1). Those affricates are important because several SwGm varieties have a distribution of velar [kx] and palatal [kç] that parallels that of [x] and [ç]. I adopt a representation of affricates in which those sounds bear [−continuant] and [+continuant], as in (2a); see Sagey (1986) and Lombardi (1990) and more recently Hall (2012).[4] Affricates are thereby distinct from stops and fricatives (2b,c). Note that the structures in (2) depart from the abbreviatory convention in (1) because [±continuant] is placed on a tier separate from the root node.

(2)


The treatment of affricates adopted here can be contrasted with the one proposed by linguists such as La Charité (1993), Rubach (1994), Clements (1999), Kim (2001) and Kehrein (2002) (on the basis of Jakobson et al. 1951), which sees affricates as strident stops without a [+continuant] component, e.g. /t/ is [−strident] and /ts/ is [+strident]. The strident stop representation is rejected here because it can capture neither the nonstrident affricate /kx/ nor the natural class of /x/ and /kx/.

The place features for the coronal nasal (/n/) and coronal liquids (/l r/) are important because those sounds can function as triggers for velar fronting. All dialects investigated have the three contrastive nasals /m n ŋ/, as well as two liquids, namely /l/ and the consonantal rhotic, which can be either coronal (/r/)

[3] The nature of the distinctive laryngeal feature in German phonology and its relationship to the phonetics has been the object of debate for many years. According to some approaches, [±fortis] is interpreted as [±voice], while others advocate an aspiration feature ([±spread glottis]) or a feature of length (singleton vs. geminate). See Iverson & Salmons (1995), Wiese (1996b), Jessen & Ringen (2002), and Beckman et al. (2009) for various proposals. The present treatment does not require a commitment to any one of those approaches.

[4] Sagey (1986) proposes a contour segment representation for affricates, while Lombardi (1990) endorses the complex segment representation. My analysis is compatible with both models.

or dorsal (/ʀ/) depending on dialect. Representations for /n l r/ are posited in (3a-c) below. The dorsal (phonetically uvular) rhotic (/ʀ/) is depicted in (3d).

(3) a. $\begin{array}{c}\begin{bmatrix}+\textsc{cons}\\+\textsc{son}\\+\textsc{nas}\end{bmatrix}\\ |\\ [\textsc{coronal}]\end{array}$ b. $\begin{array}{c}\begin{bmatrix}+\textsc{cons}\\+\textsc{son}\\-\textsc{nas}\\-\textsc{cont}\end{bmatrix}\\ |\\ [\textsc{coronal}]\end{array}$ c. $\begin{array}{c}\begin{bmatrix}+\textsc{cons}\\+\textsc{son}\\-\textsc{nas}\\+\textsc{cont}\end{bmatrix}\\ |\\ [\textsc{coronal}]\end{array}$ d. $\begin{array}{c}\begin{bmatrix}+\textsc{cons}\\+\textsc{son}\\-\textsc{nas}\\+\textsc{cont}\end{bmatrix}\\ |\\ [\textsc{dorsal}]\end{array}$

It is shown below that the place features for /r/ and /ʀ/ are phonologically relevant and that rhotics cannot be analyzed as placeless. As noted in §2.2.1 the finer-grained manner distinctions among rhotics (e.g. approximant, trill) are irrelevant for the phonology.

2.2.3 Featural representations for vowels

All German dialects discussed reflect the predominant cross-linguistic pattern in the sense that they contrast front vowels and back vowels. I adopt the proposal defended in a number of works, according to which front vowels are phonologically [coronal], as in (4); see Clements (1976), Lahiri & Evers (1991), Hume (1994), and Clements & Hume (1995), as well as Robinson (2001), Glover (2014), and Hall (2014a), who have extended that proposal to German (including regional dialects). A distinction between C-place and V-place [coronal] (e.g. Clements & Hume 1995) is not crucial and is therefore ignored.

(4) $\begin{array}{c}\begin{bmatrix}-\textsc{cons}\\+\textsc{son}\end{bmatrix}\\ |\\ [\textsc{coronal}]\end{array}$

The advantage of analyzing front vowels as [coronal] is that those sounds can be grouped together with /n l r/ as the natural class of coronal sonorants, which form the set of triggers for velar fronting in many dialects. The left-to-right spreading is depicted in the template for velar fronting in (5a). The features of the leftmost segment (trigger) and of the rightmost segment (target) are omitted here because they differ from dialect to dialect. The word-initial analogue of (5a) is presented in (5b).[5]

(5) a. Velar Fronting:

[…] […]

[CORONAL] [DORSAL]

b. Word-Initial Velar Fronting:

wd[[…] […]

[DORSAL] [CORONAL]

Given the spreadings depicted in (5), the output segment is the complex corono-dorsal segment for palatals (=1d). In phonological representations there is no temporal ordering involving place features. Thus, the features [coronal] and [dorsal] can appear in that linear sequence (as in 5a) or in the reverse (in 5b), but both structures represent palatals (in 1d).

The features for back vowels are not crucial in my treatment because they do not serve as triggers for velar fronting. There is more than one way to analyze such segments (e.g. /u o ɑ/); I posit that they are [dorsal], although it is argued in Chapter 6 that two varieties of SwGm require [peripheral] instead; recall Map 1.

The German dialects investigated provide no evidence for drawing a distinction between back vowels and central vowels (although see §15.5 for the one counterexample). From the phonological perspective, phonetically central vowels and phonetically back vowels are [dorsal], e.g. Chomsky & Halle (1968) and Rice (2002). The treatment of central vowels as [dorsal] works well in languages like MoStGm (and in all of the German dialects discussed below) because phonetically central vowels and phonetically back vowels always differ in terms of at least one other feature, one of which can be interpreted as distinctive. For example, many dialects possess a low back unrounded vowel (/ɑ/) and a mid rounded back vowel /ɔ/. Those two [dorsal] can be distinguished from one another if: (a) /ɔ/ is [−low] and /ɑ/ is [+low], or (b) /ɔ/ is [labial] and /ɑ/ lacks that feature. In dialects where /ɑ/ contrasts with a low front vowel /æ/, /æ/ is [coronal] and /ɑ/ is [dorsal]. In rare dialects there are two low nonfront unrounded vowels (/ɑ/ and /a/), but the feature distinguishing those segments is [±tense]; see §11.5. The present survey of German dialects therefore only requires [coronal] and [dorsal] (but not an additional feature like [central]) for capturing the frontness/backness

[5] I refer henceforth to the rule in question in the upper case if it is a specific instantiation of either (5a) or (5b). To distinguish the various versions in individual dialects, I also include numerical suffixes, e.g. Velar Fronting-1, Word-Initial Velar Fronting-1 etc. By contrast, the rule is given in the lower case (velar fronting) in reference to fronting in general.

dimension among vowels.[6]

One phonetically central vowel present in almost all German dialects discussed below is schwa (/ə/). A possible featural analysis for that phonetically mid central vowel is one in which it is a simplex [dorsal] sound, which is distinct from the mid back vowel /ɔ/ (=[dorsal, labial]). I alternatively adopt the proposal that schwa consists of a placeless root node, as in (6). All other vowels – referred to below as FULL VOWELS – possess place features.

(6) /ə/: $\begin{bmatrix} -\text{CONS} \\ +\text{SON} \end{bmatrix}$

A representation for schwa like the one in (6) is defended by van Oostendorp (2000: 133–134) for Dutch. According to that author's first property of schwa (p. 133), that vowel bears no phonetic features. From the point of view of phonology, van Oostendorp consequently argues that Dutch schwa is not marked for any of his vocalic (phonological) features ([high], [low], [lax], [coronal], [labial], [dorsal] in his featural system).

What is significant about the structure in (6) is that schwa has no place features, in contrast to all other vowels. Representations similar to the one in (6) have been proposed in the literature on schwa in MoStGm (e.g. Hall 1992: 208–212, Wiese 1996b: 153, 159, Trommer 2021). In contrast to the approach taken by Hall and Wiese, my treatment requires no default rule which supplies the representation in (6) with features. Thus, the structure in (6) depicts underlying schwa (e.g. in MoStGm /gənɑu/ for [gənɑu] 'exactly' or /ʃʀɑŋkə/ for [ʃʀɑŋkə] 'barrier'), which remains placeless throughout the entire phonology. Many instances of schwa in MoStGm have been argued to be epenthetic, e.g. [hɪməl] 'sky' from /hɪml/; see Wiese (1988), Hall (1992), Noske (1993), Wiese (1996b). Epenthetic schwa in German dialects (§5.4) – like underlying schwa – has the placeless structure in (6).

Since the system of phonemic vowels can differ considerably from dialect to dialect it is not feasible to list a single set of matrices here with distinctive features for individual vowels. Instead, the reader is referred to the beginning of each case study in which I list the phonemic vowels for the German variety under

[6] A number of linguists have pointed out that the approach to central vowels described above cannot be universally true because some languages contrast a central and back vowel that agree in rounding (Parker 2000, Rice 2002). For example, Norwegian (Kristoffersen 2000) contrasts three high rounded vowels, i.e. front rounded /y/, central rounded /ʉ/, and back rounded /u/. Kristoffersen consequently argues that back and central vowels are both [dorsal] and that they are distinguished with the feature [±back], i.e. /ʉ/ is [dorsal, −back] and /u/ is [dorsal, +back]. None of the German dialects investigated below has such contrasts.

discussion. In the remainder of this section I consider the features expressing height and tenseness necessary to capture certain commonly occurring vowel contrasts present in German dialects.

Vowel height is captured phonologically with [±high] and [±low], e.g. /i u/ are [+high] and /e o ɑ/ are [−high]. /ɑ/ can be distinguished from /o/ by the feature [±low], or by the feature [labial]/[dorsal], e.g. /ɑ/ is [+low] and /o/ is [−low] or /ɑ/ is [dorsal] and [o] is [labial]. Tenseness ([±tense]) distinguishes vowels at any given height, e.g. /i ɪ/ are [+high], /i/ is [+tense] and /ɪ/ is [−tense].

Some dialects are attested with phonetically low front vowels (/æ/) in addition to mid front vowels (e.g. /e ɛ/). In that type of system, /æ/ is [+low], while /e ɛ/ are [−low] and then further distinguished with [±tense], i.e. /e/ is [+tense] and /ɛ/ is [−tense]. The majority of dialects investigated below have mid front vowels (e.g. /e ɛ/) but no phonetically low front vowel /æ/. In that type of inventory the default assumption is that /e ɛ/ are distinguished from high vowels (e.g. /i/) with the feature [±high] but that they do not bear any specification of [±low], which is not a distinctive feature. As indicated in (7a), /i e ɛ/ are assigned a plus or minus value for [±high], and then the nonhigh vowels are distinguished by [±tense]. In some dialects with /e ɛ/ and no /æ/, /ɛ/ behaves phonologically like a low vowel (/æ/). For precedent outside of German dialects see van Oostendorp's (2000: 78) treatment of Dutch /ɛ/ and Dresher's (2009: 182) analysis of /ɛ œ/ in the Xibe (Manchu, Northwest China). In the type of German dialect described here, /ɛ/ is [+low], and all other front vowels are [−low]. Nonlow vowels are further distinguished by [±low], as in (7b).

(7) a.

	i	e	ɛ
[high]	+	−	−
[tense]		+	−

b.

	i	e	ɛ
[low]	−	−	+
[high]	+	−	

Following Dresher (2009) I assume that distinctive features are assigned to the phonemic inventory in a step-wise fashion. For example, given the vowels in (7a) only the [−high] vowels are assigned a value of [±tense] because [±tense] is not distinctive for [+high] vowels. [±high] is likewise assigned to the two [−low] vowels in (7b) but not to the one [+low] vowel. Note that the analysis of German vowels described here eschews default rules filling in the blanks in (7a) and (7b) with plus or minus values.

Front rounded vowels and front unrounded vowels contrast in many German dialects, e.g. MoStGm [tiːɐ] 'animal' vs. [tyːɐ] 'door'. The feature that distinguishes those two types of vowels does not play a role in most of the case studies discussed in this book. However, in certain cases a feature expressing (un)roundedness is crucial. For those few cases I adopt one of two approaches. The first one expresses front rounded vowels as complex segments consisting of [coronal] and [peripheral]; recall that the latter feature was mentioned above as one way of expressing back vowels. The complex feature approach is unique to those SwGm dialects discussed in Chapter 6. The second approach captures the distinction between front rounded vowels and their unrounded counterparts with the binary feature [±round], e.g. /y/ is [+round] and /i/ is [−round]. This treatment is the one adopted for certain LGm dialects (§12.6.1) and a velar fronting island (§15.3).

Diphthongs are represented as a sequence of two separate root nodes joined together under a single nucleus. That both parts of diphthongs have two separate root nodes has been defended by Schane (1995), Booij (1995) for Dutch as well as Wiese (1996b) and Hall (2002) for MoStGm. I give representations for the diphthong /ɑi/ (e.g. MoStGm [tsɑit] 'time') in (8a) and /iə/ in (8b). Note that the representation in (8b) for schwa lacks place features but that the representation does have a root node (=6). If both components of a diphthong are front (or back) then the place feature ([coronal]/[dorsal]) is shared by the Obligatory Contour Principle (OCP; Goldsmith 1976, McCarthy 1986, Yip 1988); see (8c) for the diphthong /ei/.[7] As mentioned in §2.2.2 the phonetic glide in diphthongs is not transcribed with a diacritic because its nonsyllabicity plays no role.

(8) a.
$$\begin{array}{cc} \begin{bmatrix} -\textsc{cons} \\ +\textsc{son} \\ +\textsc{low} \end{bmatrix} & \begin{bmatrix} -\textsc{cons} \\ +\textsc{son} \\ +\textsc{high} \end{bmatrix} \\ | & | \\ [\textsc{dorsal}] & [\textsc{coronal}] \end{array}$$

b.
$$\begin{array}{cc} \begin{bmatrix} -\textsc{cons} \\ +\textsc{son} \\ +\textsc{high} \end{bmatrix} & \begin{bmatrix} -\textsc{cons} \\ +\textsc{son} \end{bmatrix} \\ | & \\ [\textsc{coronal}] & \end{array}$$

c.
$$\begin{array}{ccc} \begin{bmatrix} -\textsc{cons} \\ +\textsc{son} \\ -\textsc{high} \end{bmatrix} & & \begin{bmatrix} -\textsc{cons} \\ +\textsc{son} \\ +\textsc{high} \end{bmatrix} \\ & \diagdown \quad \diagup & \\ & [\textsc{coronal}] & \end{array}$$

I do not include syllable structure (e.g. nucleus) in (8) or in any representation posited below for diphthongs in German dialects because that structure is not relevant for my treatment of velar fronting. The same point holds for phonological units capturing length (skeletal slots) or weight (moras).

Surface diphthongs in some languages have been argued to be derived from underlying monophthongs. For example, van Oostendorp (2000: 78) analyzes Dutch

[7] In earlier models [±high] and [±low] were argued to be under [dorsal], e.g. Sagey (1986). I follow later studies which have shown that those features are independent of [dorsal], e.g. Lahiri & Evers (1991).

/ɛi/, /œy/, and /ɒu/ as the surface manifestation of underlying short high lax vowels. The default assumption I make is that diphthongs are phonemic unless evidence can be provided to the contrary.

2.2.4 Opacity (part 1)

The theoretical literature is replete with examples of phonetic representations that seem to contradict the phonological rules of the language in question (e.g. Kiparsky 1982a, McCarthy 2009, Baković 2011 and references cited therein). The phenomenon described here is referred to as opacity, which has the formal definition (Kiparsky 1973: 79) in (9).

(9) A phonological rule P of the form A → B / C __ D is opaque if there are surface structures with either of the following characteristics:
   a. Instances of A in the environment C __ D;
   b. Instances of B derived by P that occur in environments other than C __ D.

A rule is opaque if there are surface structures (phonetic representations) that look like they should have undergone it (9a) or surface structures that underwent the rule but look like they should not have (9b). By contrast, a rule is transparent if neither of the two conditions in (9) holds.

The two types of opacity described in (9) are referred to in the later literature as underapplication and overapplication respectively (e.g. McCarthy 2009, who adopts the two terms from Wilbur 1974). Thus, rule P underapplies in (9a) because there is a surface structure ([CAD]) in which the rule should have applied, and rule P overapplies in (9b) because is creates a structure ([B]) not specified in its structural description.

Kiparsky (1973) argues that the two types of opacity in (9) can be equated with counterfeeding and counterbleeding orderings respectively. Transparent orderings involve the converse orderings, namely feeding and bleeding.

Rule opacity and rule transparency and their relationship to the orderings referred to above can be illustrated with a simple example involving the two rules in (10) from a hypothetical language. The example discussed here (modified slightly) is drawn from Baković (2011).

(10) a. Deletion: vowel ⟶ ∅ / __ vowel
   b. /t/-Palatalization: /t/ ⟶ [tʃ] / front vowel __

Given the underlying representations /tue/ and /tio/, the respective phonetic representations are transparent if Deletion applies before /t/-Palatalization (see 11a). In (11ai), Deletion feeds /t/-Palatalization because the elimination of /u/ places the preceding /t/ before a front vowel, which is precisely the context for /t/-Palatalization. Put differently, this is a feeding order because Deletion creates a structure to which /t/-Palatalization can apply. Deletion bleeds /t/-Palatalization in (11aii) because the elided /i/ would have triggered the palatalization of the preceding /t/ if it had not been eliminated. This is a bleeding order because there is a potential structure to which /t/-Palatalization could apply which is removed by Deletion. Significantly, neither output in (11a) is opaque; hence, [tʃe] and [to] show the transparent application of Deletion and /t/-Palatalization.

(11) a. Feeding and bleeding:

	i. /tue/	ii. /tio/
Deletion	te	to
/t/-Palatalization	tʃe	----
	[tʃe]	[to]

b. Counterfeeding and counterbleeding:

	i. /tue/	ii. /tio/
/t/-Palatalization	----	tʃio
Deletion	te	tʃo
	[te]	[tʃo]

Reversing the ordering of the two rules (=11b) yields opacity. In (11bi) Deletion counterfeeds /t/-Palatalization. The reason is that the elimination of /u/ causes /t/ to become adjacent to the front vowel /e/, but /t/-Palatalization cannot apply because that rule precedes Deletion. In (11bii) Deletion counterbleeds /t/-Palatalization because the deleted /i/ is a front vowel, which triggers /t/-Palatalization before deleting. In (11bi) /t/-Palatalization underapplies because there is a surface structure in which the rule should have applied (i.e. [te]). By contrast, in (11bii) /t/-Palatalization overapplies because there is an instance of a sound created by that rule that occurs in a context not specified by the rule (i.e. [tʃ] before the back vowel [o]).

Rules interacting with velar fronting can alter either the triggers or the targets for that process. That point can be illustrated with the hypothetical language in (11). Consider first (11ai), where Deletion feeds /t/-Palatalization by creating a new trigger for the latter process. Changes not depicted in (11) might feed /t/-Palatalization by increasing the number of targets for that rule. For example, if there were a change from /d/ to [t] in word-initial position (/d/-Fortition), and if the output of that change undergoes /t/-Palatalization, then /d/-Fortition feeds /t/-Palatalization by creating a new target; hence, /di/ surfaces as [tʃi]. In (11bi) Deletion counterfeeds /t/-Palatalization by increasing the number of potential triggers. However, if /d/-Fortition does not feed /t/-Palatalization then the latter process is counterfed by the former because it creates a new target which is immune to /t/-Palatalization; hence, /di/ surfaces as [ti].

Transparent and opaque interactions are summarized in (12), which is taken from Baković (2011: 43), who in turn bases this classification on earlier work by Kiparsky and McCarthy.[8]

(12)

transparent		opaque	
feeding	bleeding	type (9a) underapplication	type (9b) overapplication
		counterfeeding	counterbleeding

An additional type of interaction involves the MUTUAL BLEEDING of two rules. That refers to a situation in which a rule A bleeds a later-ordered rule B and where rule B would also bleed rule A if it were ordered before rule A (Baković 2011). That type of interaction is illustrated in the example from northern German dialects in (13) modified slightly from Kiparsky (1982a: 66).

(13) Mutual bleeding:

	a. /laŋg/	b. /laŋg-ə/
Final Fortition	laŋk	----
g-Deletion	----	laŋə
	[laŋk]	[laŋə]
	'long'	'long-INFL'

	c. /laŋg/	d. /laŋg-ə/
g-Deletion	laŋ	laŋ
Final Fortition	----	----
	*[laŋ]	[laŋə]

[8] Baković (2011) shows that the classification in (12) is not sufficient for several reasons. For example, a counterfeeding interaction does not always result in underapplication, and counterbleeding is not the only way to describe actual examples illustrating overapplication. What is more, a counterbleeding relationship does not always exhibit overapplication.

Final Fortition affects all obstruents in a coda, while g-Deletion eliminates /g/ after a nasal. In (9a), Final Fortition bleeds g-Deletion, while the reverse ordering in (9b) shows that g-Deletion bleeds Final Fortition. Examples (13b,d) illustrate g-Deletion in the context before a vowel.

Mutual bleeding – in contrast to counterbleeding – does not involve opacity. In particular, neither [laŋk] in (9a) nor [laŋə] in (13b,d) exhibit overapplication or underapplication of Final Fortition or g-Deletion. Mutual bleeding therefore exemplifies a transparent interaction.

The distinction between transparency and opacity as they relate to velar fronting is a significant theme in the present book. I show below that the fronting of velars is transparent in some dialects and opaque in others. From the synchronic perspective, the transparent process of velar fronting is either fed or bled by an independent process (as in 11a), or velar fronting and another process stand in a mutually bleeding relationship (as in 13a). Several dialects are attested in which velar fronting exhibits underapplication because it is counterfed synchronically by another process (as in 11bi). No dialect has been found in which velar fronting overapplies synchronically by being counterbled by another process (as in 11bii); see Chapter 5 for discussion.[9]

Opacity is defined above in synchronic terms, but it is also possible to view diachronic changes as opaque or transparent even though the sound changes are no longer active as synchronic rules. It is demonstrated in the following chapters that the historical process fronting velars has become opaque through time in many varieties and that the type of opacity referred can involve both underapplication as well as overapplication; see Chapter 6 - Chapter 9 for extensive discussion.

2.3 Typology of velar palatalization

One of my goals is to compare the patterning of velar fronting in German dialects with rules fronting velars in other languages; recall research questions (9) in §1.4.4. Processes fronting velar sounds like /k/ and /x/ to a position towards the front of the oral cavity in the neighborhood of front vowels have been studied extensively in the literature, which traditionally refers to the change in question as VELAR PALATALIZATION. I retain the term VELAR FRONTING, which can be

[9] My main concern is opacity as it relates to velar fronting. It will be seen in the ensuing chapters that synchronic counterbleeding orderings are indeed required (=11bii), but that neither of the rules involved is velar fronting. However, that counterbleeding relationship does not result in overapplication (recall Map 8).

viewed as a special type of velar palatalization. In the present section I clarify that assertion by examining the findings in the typological literature on velar palatalization. The reader is referred to Appendix I, which contains some discussion of velar palatalization in the branches of Gmc not discussed in this book (both WGmc and NGmc) as well as two language families spoken adjacent to German-speaking countries, namely Romance and Slavic.

2.3.1 Introduction

The cross-linguistic literature on velar palatalization is extensive. Many linguists consider the phonetics of velar palatalization (e.g. Guion (1998), Recasens 2020), while others examine the phonology (e.g. the featural aspects), e.g. Lahiri & Evers (1991), Hume (1994), Clements & Hume (1995). Considerable work focuses on velar palatalization (synchronic or diachronic) in individual languages or language families. Some of that research (listed alphabetically in terms of the language) includes Greek (Newton 1972b, Manolessou & Pantelidis 2013), Polish (Ćavar 2004, Gussmann 2004), Slovene (Jurgec 2016), and Latvian (Urek 2016), although many other language families could be added to that list. There is also a small but growing body of research investigating the typological aspects of velar palatalization, e.g. Neeld (1973), Chen (1973), Bhat (1978), and most recently Bateman (2007, 2011), Kochetov (2011), Krämer & Urek (2016), and Recasens (2020).[10]

The typological research referred to above – in particular Bateman (2007, 2011) – has shown that palatalization can target velar consonants and that the outputs can be quite diverse. In Table 2.3 I present the most common targets and outputs for velar palatalizations as discussed in the literature. Velar fronting in German dialects has a much more restricted set of outputs, as indicated in Table 2.4.[11]

There are two significant differences between Tables 2.3 and 2.4: (a) The output of velar fronting is the corresponding palatal (i.e. [k g x ɣ kx ŋ] are fronted to [c ɟ ç ʝ kç ɲ]); hence, the manner of articulation does not change. However, velar palatalization often changes the manner of articulation for stop targets ([k g]),

[10] The typological literature cited above investigates velar palatalization in the context of PALATALIZATION in the broad sense of the word. For example, in many languages alveolar (coronal) sounds like /t/ are realized (palatalized) as postalveolar ([tʃ]) in the context of front vowels (recall the hypothetical rule in 10b). The typological literature also considers the palatalization of labial sounds like /p/, which is rare.

[11] The lenis velar fricative [ɣ] and the velar affricate [kx] are not included in Table 2.3 because the languages surveyed with velar palatalization do not have those sounds. I do not consider that omission to be significant.

Table 2.3: Velar palatalization targets and outputs

	target	output
Stop	[k]	[kʲ c cʲ tʃ tʃʲ ç]
	[g]	[gʲ ɟ dʒ]
Fricative	[x]	[xʲ ç ɕ ʃ]
Nasal	[ŋ]	[ŋʲ ɲ]

Table 2.4: Velar fronting targets and outputs

	target	output
Stop	[k]	[c]
	[g]	[ɟ]
Fricative	[x]	[ç ɕ]
	[ɣ]	[ʝ]
Affricate	[kx]	[kç]
Nasal	[ŋ]	[ɲ]

which can surface as affricates ([tʃ dʒ]);[12] and (b) velar palatalization changes either (i) the primary place of articulation (FULL VELAR PALATALIZATION), e.g. velar [x] is realized as palatal [ç], or (ii) adds SECONDARY PALATALIZATION to a primary place of articulation, e.g. velar [k] surfaces as secondarily palatalized velar [kʲ]. By contrast, velar fronting changes only the primary place of articulation.[13]

Velar palatalization and velar fronting differ in terms of triggers. The typological literature on velar palatalization demonstrates that triggers for that process consist of front vowels (or some subset thereof) and the palatal glide [j] (if present). My own study reveals that there are two ways in which velar fronting triggers are broader than velar palatalization triggers. First, velar fronting is typically induced by front vowels and coronal sonorant consonants ([r l n]). Second, velar fronting can occur in the context of one or more back vowel. In fact, in many dialects velar fronting affects velar sounds adjacent to any sound; hence, in that type of system velar fronting has no segmental trigger at all.

The restricted set of triggers for velar palatalization has led many researchers to make the following assumptions:

(14) a. Velar palatalization is always assimilatory;
b. velar palatalization is always triggered by one or more front vowel;

[12] Both velar palatalization and velar fronting can involve a minor manner change in the case of the target nonsibilant fricative [x], which fronts/palatalizes to the sibilant fricative [ɕ].

[13] My assertion that German dialects exhibit the restricted set of outputs in Table 2.4 and not the broad one in Table 2.3 is based on my scrutiny of the original sources for over three hundred varieties of German. To be clear: I do not deny that there might be dialects of German with the broad set of outputs in Table 2.3, e.g. [xʲ] for /x/ or [tʃ] for /x/. See §11.1 for brief discussion of the realization of fronted velar stops as affricates. However, based on the preponderance of the evidence discussed in the remainder of this book, the broad set of outputs in Table 2.3 clearly represents less preferred patterns.

c. velar palatalization cannot occur in the context of back vowels;
d. velar palatalization must have a segmental trigger;
e. velar palatalization is not triggered by consonants in addition to (front) vowels.

Note that the two statements in (14c,d) are corollaries of (14a). Since palatalization is considered to be a prototypical rule involving consonant-vowel place interactions, the trigger is said to comprise front vowels only (=14b), but not a set of (front) consonants and (front) vowels (=14e).[14]

The behavior of velar fronting in German dialects is significant because it demonstrates that none of the statements in (14) can be unconditionally true. First, many varieties are attested in which velars undergo fronting regardless of the nature of the following sound. That type of velar fronting is significant because it poses a clear challenge for (14a,b,d). Second, velar fronting in many varieties – including MoStGm – consists of front vowels and coronal sonorant consonants, thereby counter-exemplifying (14e). Third, a set of dialects is attested in which velar fronting occurs in the context of a preceding back vowel, thereby calling (14c) into question.

In (15a) I provide the definition for full palatalization (Bateman 2011) and in (15b) a parallel definition of velar fronting. The term VOCOID in (15a) is the set of vowels and glides ([j]).

(15) Definition of full palatalization (in 15a) and velar fronting (in 15b):
a. "A consonant changes its primary place of articulation and often its manner of articulation, while moving toward the palatal region of the vocal tract when adjacent to a high and/or front vocoid…". (Bateman 2011: 589).
b. A velar consonant changes its primary place of articulation, while moving toward the palatal region of the vocal tract (thereby creating palatal or alveolopalatal sounds) usually when adjacent to a front vowel or coronal sonorant consonant.

Note that the wording of (15a) accounts for the diverse set of outputs in Table 2.3 while simultaneously capturing the generalizations in (14). By contrast,

[14] According to Kochetov (2011), palatalization *usually* (my emphasis) arises under the influence of an adjacent front vowel (including [j]). Krämer & Urek (2016: 2) make passing reference to languages in which some kind of palatalization occurs without a front vowel trigger, although they refrain from discussing those examples. That point aside, there is certainly unanimous agreement in the literature that a system in which velar palatalization is triggered by a back vowel is peculiar and possibly without precedent.

velar fronting is defined in such a way to admit only the restricted outputs in Table 2.4, but it does not imply the validity of the statements in (14).[15] In any case, the prose statement of velar fronting in (15b) is expressed formally as the spreading of the frontness feature [coronal], as in (5), or as the addition of that feature in dialects where velar fronting does not function as an assimilation.

The charts in Tables 2.3 and 2.4 and the description of triggers given above do not give any indication of what targets and triggers are more common or whether or not there are any exceptionless cross-linguistic generalizations which can be made. In §2.3.2–§2.3.5 I discuss that type of issue.

2.3.2 Targets

According to Bateman (2007: 56ff.) the most common targets for palatalizations (in the broad sense of the word) are obstruents (as opposed to sonorants). Languages with stops as targets outnumber those with fricatives. The next best targets are nasals followed by laterals, and finally by rhotics. It is not possible to posit implications involving the preference for stops over fricatives (e.g. "If a fricative is a target for palatalization, then a stop is also a target") because there are too many counterexamples, i.e. languages in which fricatives but not stops serve as palatalization targets. Bateman writes that "…there is an overwhelming tendency in most languages for obstruents to palatalize most often, followed by the other manners of articulation …".

The generalization described in the preceding paragraph concerning obstruent vs. sonorant targets also holds for velar fronting, although the only sonorant target for velar fronting is [ŋ].[16] Only a small number of dialects exhibit the fronting of a velar nasal; however, of those dialects with that change, velar stops and velar fricatives also undergo fronting. One exceptionless generalization for velar fronting is expressed in (16).

(16) Implicational Universal for Velar Fronting Targets-1:
If a velar stop (/k g/) undergoes velar fronting then the corresponding fricative (/x ɣ/) does as well.

[15] In an attempt to eschew an overly wordy definition, I do not attempt to express the fact that the alveolopalatal sound referred to in (15b) is the fricative [ɕ] from the target [x]. It should go without saying that the properties of velar fronting described in the remainder of this section cannot be included in the definition presented in (15b).

[16] No dialect is attested with a velar lateral (/ʟ/) which could potentially serve as a target for velar fronting. Since /ʀ/ is represented as [dorsal] (=2d), it is a potential target segment. No dialect of German – or any natural language to the best of my knowledge – is attested in which /ʀ/ undergoes fronting (=6).

(16) suggests that the preferred target for velar fronting is a fricative (/x/) and not a stop (/k/); recall the MoStGm data in §1.2. Dialects lending support to (16) are discussed in Chapter 11.

One generalization concerning velar fronting targets not discussed in Bateman (2007, 2011) relates to the distinction between lenis (e.g. /g/) vs. fortis (e.g. /k/) sounds. There is strong evidence from phonetics – also reflected in typological work – that fortis sounds make for better targets than lenis sounds. That generalization apparently holds for stops at all places of articulation. For example, in their typological survey of ASSIBILATIONS – the change from an alveolar stop like /t/ or /d/ to an affricate like [ts] or [dz] in the context of a front vocoid – Hall & Hamann (2006) show that lenis /d/ cannot assibilate unless the corresponding fortis sound (/t/) does. The phonetic reason for that observation is discussed in Hall et al. (2006): In a sequence like /ti/ the friction phase (which arises after the release of a coronal stop before a high vowel) has a longer duration than the one in a sequence like /di/. In her study of velar palatalization, Guion (1998: 20) observes the same asymmetry involving lenis ("voiced") vs. fortis ("voiceless") velar targets and concludes that "[v]oiceless velars are more likely to palatalize than voiced velars". Giuon observes that the cases of velar palatalization discussed in Bhat (1978) involve either: (a) cases of lenis and fortis targets, or (b) fortis only targets, but no cases of lenis only targets. The studies cited here suggest the implication in (17). I state (17) with respect to velar fronting, although it is probably more general in its scope.

(17) IMPLICATIONAL UNIVERSAL FOR VELAR FRONTING TARGET-2:
If a lenis sound undergoes velar fronting then the corresponding fortis sound does as well.

(17) is exceptionless in the studies cited above (for velar stops as target segments). It remains to be seen whether or not that implication can also be confirmed for velar fricatives as targets. In any case, it is demonstrated below that German dialects obey (16) and (17) for either velar stops or velar fricatives as target segments; see §4.5.1, §11.8.1, and §12.7.2 for discussion.

2.3.3 Triggers

It is undeniably the case that the unmarked context for velar palatalization is the set of front vowels, especially the high front vowel /i/; see Bateman (2007: 62) and Kochetov (2011). The latter author notes that palatalization (in the general sense) is only rarely triggered by low front vowels (e.g. /æ/). In fact, there is agreement in the literature that low and mid front vowels only trigger palatalization if high vowels trigger it as well (Neeld 1973: 37, Chen 1973: 177, Bateman 2007: 64, and Kochetov 2011). Bateman (2007: 64) posits the implication in (18), which is apparently exceptionless. The implication is also shown below to be exceptionless for velar fronting in German dialects.

(18) Implicational Universal for Palatalization Triggers:
If lower front vowels trigger palatalization, then so will higher front vowels.

The generalization expressed in (18) has been argued to be grounded in phonetics. For example, in her perception study on the realization of velars like /k/ as postalveolar affricates ([tʃ]), Guion (1998) shows that the acoustic similarity between the target ([k]) and output ([tʃ]) is greater before high front vowels than before mid and low front vowels. The conclusion is that high front vowels are more favorable triggers for velar fronting than nonhigh front vowels.

Nonheight features seldom play a role in defining the natural class of vocalic triggers for velar palatalization (Bateman 2007: 62). In particular, Bateman finds that features such as vowel length, rounding, or nasality do not make a difference in a front vowel's ability to serve as a trigger. Thus, short front vowels, long front vowels, front rounded vowels, front unrounded vowels, front nasalized vowels and front oral vowels can induce palatalization. One exception to this generalization (Bateman 2007: 54–55) is Fanti (Niger-Congo, Ghana), in which /x/ palatalizes only before a front non-nasal vowel. German dialects in which velar fronting is sensitive to nonheight features are exceedingly rare; see §12.6 for dialects in which roundedness, tenseness, and stress can play a role in defining the set of front vocalic triggers. The role of nasality as a factor in defining the triggers for velar fronting is discussed briefly in §15.9.[17]

2.3.4 Outputs

Typological studies agree that the preferred outputs for velar palatalization with stops as targets (/k g/) are sibilant affricates (i.e. postalveolar [tʃ dʒ]). That type

[17]One feature not mentioned above is vowel length. In a recent study, Cardoso & Honeybone (forthcoming) show convincingly that the velar fricative derived through the lenition of /k/ in Liverpool English surfaces as palatal ([ç]) after a high, front vocalic trigger. Significantly, that trigger must be bimoraic, i.e. a long monophthong (/iː/) or a diphthong (e.g. /aɪ/), since that change does not occur after a short monophthong (/ɪ/). From the formal point of view, their rule (Dorsal Fricative Assimilation) spreads the frontness feature ([palatality] in their system) to the right, but spreading only occurs if the vocalic trigger is foot-final, which is precisely the case when that vowel is bimoraic. I do not discuss quantity-sensitivity as a trigger in this book because no parallel cases involving velar fronting in German dialects are known to me.

of output is more common than palatal nonsibilant stops (=[c ɟ]). Bateman (2011: 595) writes: "The most common full palatalization outcomes for the coronal and dorsal oral stops /t/, /d/ and /k/, /g/ are … [tʃ] and [dʒ]". Kochetov (2011) likewise writes: "Overall, there is a tendency for place-changing palatalizations to result in sibilants rather than non-sibilants". The data in those sources (and in Guion 1998) suggest that there is a similar generalization for velar palatalization with fricatives as targets in the sense that sibilant fricatives ([ʃ ʒ]) are the preferred output to nonsibilant fricatives (=[ç ʝ]). These generalizations are stated in (19):

(19) a. If the target for velar palatalization is a stop (/k g/) then the preferred output is a sibilant affricate ([tʃ dʒ]).
b. If the target for velar palatalization is a fricative (e.g. /x/) then the preferred output is a sibilant (e.g. [ʃ]) rather than a nonsibilant ([ç]).

The rarity of sounds like [ç] as the output correlates with the findings in Maddieson (1984: 43–47), who concludes that the sibilant [ʃ] is the second most common fricative (behind [s]), while the nonsibilant [ç] was the second least common (before pharyngeal [ħ]).

The data from German dialects discussed below reveal that neither of the statements in (19) can be confirmed: For both velar stops and velar fricatives the preferred output is a nonsibilant (e.g. MoStGm). However, there are some areas to be investigated below (Chapter 10) in which the target fricative /x/ surfaces as the sibilant alveolopalatal fricative [ɕ].

2.3.5 Directionality and adjacency

An additional parameter discussed in the typological literature on palatalization is directionality. If the target (e.g. /k/) is situated to the left of the trigger (e.g. /i/) then palatalization occurs from right to left (regressive), but if the target is to the right of the trigger then palatalization occurs from left to right (progressive). The literature is in agreement that both options are well-attested, but that regressive assimilation is the preferred option. I refer to that generalization as the Directionality Parameter for Palatalization, which I state in (20); see Bateman (2007: 75–77). A final parameter is whether or not the target and trigger can be separated by an intervening sound (ADJACENCY). The literature is in agreement that in the overwhelming number of cases the trigger and target for palatalization must be adjacent; see Bateman (2007: 75–77) and Kochetov (2011). I state that generalization in (21).

(20) Directionality Parameter for Palatalization: The preferred direction for palatalization is right to left (regressive); hence, the trigger follows the target. Progressive palatalization is also possible, although it is less preferred.

(21) Adjacency Parameter for Palatalization: The trigger and target for palatalization are almost always adjacent.

The Directionality Parameter is counterexemplified by velar fronting, which applies progressively, e.g. MoStGm [kuːxən] 'cake' vs. [kʏçə] 'kitchen'. Surprisingly, German dialects do not exhibit variation with respect to the directionality of velar fronting. I state that exceptionless generalization in (22). Finally, the data discussed below from German dialects support (21), which I restate in (23) in terms of velar fronting:

(22) Directionality of Velar Fronting: If a target for velar fronting is situated after a sonorant and before a vowel then the trigger is always the sonorant to the immediate left of that velar sound.

(23) Adjacency Parameter for Velar Fronting: The trigger and target for palatalization are almost always adjacent.

The relevance of adjacency is discussed in the dialects investigated in Chapters 6 and 11; see also the discussion in §12.8.1. Directionality is discussed in §6.5.2 and §16.5.

2.4 Historical phonology

I adopt historical models that account for the changes involving trigger and target segments for velar fronting (§2.4.1) as well as historically opaque velars and palatals (§2.4.2, §2.4.3). Structural and nonstructural causes of velar fronting are discussed in §2.4.4.

2.4.1 Rule generalization

Sound change often begins with a highly restricted environment in which phonetic conditions are particularly favorable and then progressively spreads through time and space to include more general triggers. The name for type of development is RULE GENERALIZATION (Vennemann 1978, Bermúdez-Otero 2015, Hinskens 2021).[18]

[18]The phenomenon is also frequently referred to by alternate names, e.g. PHONETIC ANALOGY (e.g. Benware 1996 from Schuchardt 1885).

Rule generalization can be illustrated with the material discussed Benware (1996) and more recently Ramsammy (2015), which involves the change from [s] (/s/) to [ʃ] (/ʃ/) in word-initial position before a sonorant consonant in German dialects (s-Palatalization). On the basis of orthographic evidence in manuscripts written between 1300 and 1550, Benware shows that s-Palatalization occurred first before /l/, next before /l n/, then before /l n m/, and finally before /l n m w/. Those four historical stages are illustrated in (24). Note that the [ʃ] (/ʃ/) realization is reflected in MoStGm orthography as *sch*.

(24)
a. /s/ > /ʃ/ / $_{\text{wd}}$[___ /l/ MHG *sleht* > MoStGm *schlecht* 'bad'
b. /s/ > /ʃ/ / $_{\text{wd}}$[___ /l n/ MHG *snel* > MoStGm *schnell* 'fast'
c. /s/ > /ʃ/ / $_{\text{wd}}$[___ /l n m/ MHG *smal* > MoStGm *schmal* 'narrow'
d. /s/ > /ʃ/ / $_{\text{wd}}$[___ /l n m w/ MHG *swarz* > MoStGm *schwarz* 'black

The four contexts in (24) reflect the progressive historical stages of s-Palatalization, as illustrated in (25):

(25) Increase in triggers for s-Palatalization:

Stage A	yes	no	no	no
Stage B	yes	yes	no	no
Stage C	yes	yes	yes	no
Stage D	yes	yes	yes	yes
	↑	↑	↑	↑
	{l}	{l n}	{l n m}	{l n m w}

Rule generalization as proposed in the literature cited above is defined in terms of triggers, but other linguists have made similar claims concerning targets. In particular, the proposal has been made that sound change can involve a gradual extension in the number of segments undergoing the change.[19] For example, Davis et al. (1999) argue that there was a gradual increase in the number of target segments that underwent the historical change from /p t k/ to the corresponding affricates or fricatives in German dialects (OHG Consonant Shift). The generalization is that /t/ was affected first, followed by /p/, and then /k/. The gradual increase in target segments for affrication in word-initial position is depicted in

[19] An earlier proponent of that approach is defended by King (1969: 58–63), who discusses various changes in the history of German involving the extension of target segments (=rule simplification in his terminology). For example, King demonstrates that the historical rule of German devoicing obstruents in final position (Final Fortition in 13) was preceded by a stage in which only fricatives but not stops devoiced.

(26). Davis et al. (1999) argue that the place asymmetry illustrated here is a consequence of phonological markedness and complexity of representation; hence, /t/ was affected first because it was the least marked (and has the least complex phonological representation), and /p/ was affected more than /k/ for the same reasons.

(26) Increase in number of targets (OHG Consonant Shift):

Stage A	yes	no	no
Stage B	yes	yes	no
Stage C	yes	yes	yes
	↑	↑	↑
	{t}	{p t}	{p t k}

Sound change begins in a FOCAL AREA (Hock 1986: 440) and then spreads both temporally and geographically from that point of origin. Spreading typically involves triggers and/or targets, which gradually expand in the focal area to include more and more segments. The original change in the focal area also spreads geographically in the sense that outlying areas adopt it. Significantly, the change is active the longest in the focal area, and it is there where it reaches its most general form in terms of the number of triggers/targets. However, in some of the outmost areas the change never progresses to the more general contexts in the focal area. The important point is that the focal area is the place where that process has the most general the set of triggers/targets.[20]

For (26), dialects with the largest set of targets (/p t k/) reflect those areas where the change began (Switzerland), while those with the fewest targets (/t/) indicate regions where the change was most recent (parts of central Germany). This means that the change was phonologized (in Switzerland) by affecting only /t/, and then /p/ and /k/ were eventually added to the set of targets in that order. While rule generalization was transpiring temporally in Switzerland, it also spread geographically (to the north).[21]

An examination of the material from German dialects reveals that the set of triggers and targets for velar fronting exhibits variation. I argue that that variation in terms of space (dialects) is a reflection of temporal change; hence, the

[20] This interpretation of the spread of a rule from a focal area has been endorsed by a number of linguists. One of the first was Schuchardt (1885: 61f.). See also Robinson & van Coetsem (1973: 345) and Kiparsky (1988: 393–394).

[21] Davis et al. (1999) also argue that the change from /p t k/ to the corresponding fricatives in word-internal and word-final position (OHG Consonant Shift) exhibited a gradual increase in the number of triggers: In the first stage that change was induced by preceding short vowels and in the next stage the triggers were extended to include long vowels. In the final stage consonants served as triggers.

set of triggers and targets initially consisted of a small number of segments, and language change involved the gradual extension of both trigger and target segments. I employ the term "rule generalization" to describe both the increase in triggers and targets.[22]

The way in which rule generalization works in terms of time and space is depicted abstractly in Figure 2.1. The three stages referred to here can be thought of in terms of rule generalization: The white squares illustrate the rule as it is first phonologized with a narrow set of targets and/or triggers (X). The lined squares show the same rule with an expanded set of targets and/or triggers (X, Y), and the black squares represent the same rule with targets and/or triggers that are further expanded (X, Y, Z).

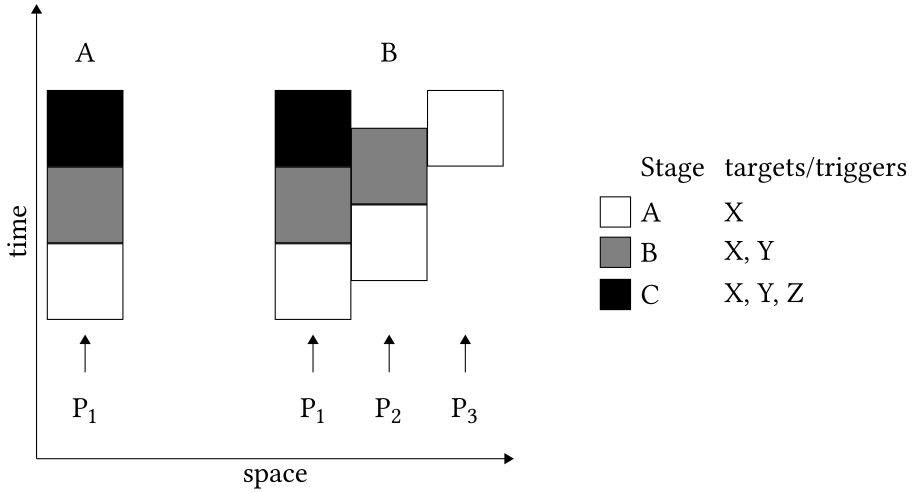


Figure 2.1: Rule generalization in time and space

Consider first column A, which illustrates how a rule (R) spreads temporally: R is phonologized in a particular place (P_1) for a certain set of targets and/or triggers which are defined as Stage A (white square). At some point in the future (lined square) R generalizes in P_1 to include more target segments and/or more

[22]Hypothetically one might argue that change involves not an extension of targets and triggers, but instead the opposite. On that view, s-Palatalization, for example, applied first in the general environment in (24d) and then worked its way to the least specific environment in (24a). I reject that interpretation of targets and triggers in the material presented in the ensuing chapters. An advantage of the present approach is that an extension of velar fronting triggers from specific to general can be shown to be phonetically grounded; recall the discussion of the implications in (17) and (18) in §2.3. By contrast, the change from general triggers to specific ones would be phonetically arbitrary.

triggers (Stage B), and then at a later point R is generalized in P_1 further (black square) to attain Stage C.

Now consider column B, which depicts R in time (vertically) and in space (horizontally). As in column A, R is phonologized in column B in a particular place (P_1) for targets and/or triggers defined as Stage A (white square), and at a later point in time R generalizes its targets and/or triggers to attain Stage B in P_1 (lines square). Sometime after R has been active in P_1 at Stage 1 R also spreads geographically by phonologizing in a neighboring place (P_2; white square). When R is phonologized in P_2 its targets and/or triggers are defined narrowly as Stage A (white square). At the top of column B it can be seen that R generalizes further in P_1 to attain Stage C (black square) and that R also spreads temporally in P_2 by attaining the targets and/or triggers representing Stage B (lined square). At around the same time, R phonologizes with the narrow set of targets/triggers (white square) in a third place (P_1).

The examples presented above and throughout this book should make it clear that rule generalization is well-attested in Gmc. However, the literature is also clear that the same phenomenon can be found in other language families. Consider the history of Romance. An early study documenting rule generalization in that language family is Foley (1975), who writes (p. 47): “Many rules which apply in only a restricted environment in Latin apply with less restriction in Romance”. For example, Foley observes that the rule of Nasalization in Latin (/VN/⟶[Ṽ]) applied only before continuants but that the same process in French is triggered by a following continuant or stop. His remaining five examples involve syncope, vowel shortening, vocalization, and vowel lowering which all applied in Latin in specific contexts and were then generalized to applying in a broader set of contexts in modern Romance languages.

A more recent case study involving rule generalization in the history of Romance is discussed by Ramsammy (2015). His example concerns the context for Velarization – the neutralization of place contrasts to [ŋ] in word-final position – in modern varieties of Spanish. In some dialects (e.g. Peninsular Spanish, Cuban Spanish), Velarization only applies prepausally and prevocalically. However, in other dialects (Caracas dialect of Venezuelan Spanish) Velarization also occurs before a consonant. Ramsammy’s data reveal that within the latter variety there are three distinct patterns which depend on the place of articulation of the consonant following the nasal. To simplify, the three synchronic patterns support a diachronic trajectory with rule generalization: The first stage is the avoidance of a [dorsal] consonant, the second the avoidance of a [dorsal] or a [labial] consonant, and the third stage the avoidance of a [dorsal], [labial], or [coronal] consonant.

2.4.2 Opacity (part 2): Neutral vowels

Neutral vowels are defined as phonetically front (coronal) vowels that do not behave phonologically as coronal. The term "neutral" is taken from the literature on vowel harmony (e.g. van der Hulst & van de Weijer 1995), although my usage of the term is not exactly the same as the usage of the term in that literature. For clarity, front vowels that behave phonologically as coronal are referred to below as NONNEUTRAL VOWELS.

Front nonneutral vowels are represented with the feature [coronal], as in (4). That structure is repeated in (27a) with the addition of [αF], which is intended to indicate the presence of other distinctive features (e.g. [±high], [±low]). The structure in (27a) contrasts with the one in (27b) for neutral vowels. It can be seen that (27b) is a vowel marked for major class features and other nonplace distinctive features ([αF]) but not for place features. Vowels with that representation cannot behave phonologically like front vowels because they lack the feature [coronal]. Since back vowels bear at least one place feature (e.g. [dorsal]), the structure in (27b) cannot be interpreted as a phonologically back vowel. (27b) is also distinct from schwa (/ə/), which is only marked for the two major class features (recall 6).

(27) a. Front nonneutral vowel

$$\begin{array}{c}\begin{bmatrix}-\textsc{cons}\\+\textsc{son}\\\alpha\text{F}\end{bmatrix}\\ |\\ [\textsc{coronal}]\end{array}$$

b. Neutral vowel

$$\begin{bmatrix}-\textsc{cons}\\+\textsc{son}\\\alpha\text{F}\end{bmatrix}$$

An example of a non-Gmc language with a neutral vowel that contrasts with a nonneutral vowel comes from Inuit dialects spoken in Alaska described by Dresher (2009: 166–167), although Dresher does not use the terms "neutral vowel" or "nonneutral vowel". Dresher draws a distinction between two kinds of /i/, which he refers to as "strong i" (<⁺/i/) and "weak i" (<⁺/ə/). In North Alaskan Inupiaq, strong /i/ triggers the palatalization of alveolar consonants, but weak /i/ does not. The contrast between these two /i/ sounds is illustrated in (28). The suffixes in (28a) have an initial alveolar consonant (/l n t/) following a stem ending in the vowel /u/. The suffixes in (28b) show the effects of a rule (Palatalization) changing a suffix-initial consonant following strong /i/. Note that Palatalization involves the change from /l n t/ to [ʎ ɲ s]. The examples in (28b) can be contrasted with the ones in (28c), which illustrate that Palatalization does not occur after the weak /i/. Hence, /l n t/ surface after weak /i/ as [l n t] without change. Weak /i/ can therefore be thought of as opaque because Palatalization underapplies after that sound.

(28)

	Stem	Gloss	*'and a N'*	*'N plural'*	*'like a N'*
a.	iglu	'house'	iglulu	iglunik	iglutun
b.	iki	'wound'	ikiʎu	ikiɲik	ikisun
c.	ini	'place'	inilu	ininik	initun

There are additional arguments supporting the distinction between the two kinds of /i/ vowels. First, only the weak /i/ changes to [a] before another vowel, but strong /i/ does not. Second, only weak /i/ alternates with [u] and with zero (i.e. it syncopates).

In present terms, strong /i/ in (28b) has the nonneutral representation in (27a), and weak /i/ is a neutral vowel with the representation in (27b). This analysis is essentially the same as the one proposed by Dresher (2009: 166), who analyzes strong /i/ as [coronal] and weak /i/ as " … not coronal". Since Palatalization only applies after a [coronal] vowel, only the stem-final /i/ in (28b) will trigger the change, but not the stem-final /i/ in (28c). The discussion of neutral and nonneutral vowels is summarized in Table 2.5.

Table 2.5: Two properties of neutral and nonneutral vowels

	[coronal] present	Historically back
Neutral vowel (=27a)	no	yes
Nonneutral vowel (=27b)	yes	no

Two velar fronting islands of Switzerland are discussed in Chapter 6 with neutral vowels exhibiting the two properties in Table 2.5. As noted briefly in §1.4.1, in one of those dialects, /x/ undergoes velar fronting after /ei/ but not after /øi/. I argue that the /i/ in the former diphthong has the nonneutral representation in (27a) but the /i/ in opaque diphthongs like /øi/ has the neutral structure in (27b). Since /øi/ derived historically from the back vowel /ou/, examples in which /x/ surfaces without change as velar after /øi/ exhibit underapplication in the sense that velar fronting is counterfed historically by the rule that restructured /ou/ to /øi/.

2.4.3 Opacity (part 3): Quasi-phonemicization and phonemicization

A number of scholars in the traditional literature on historical linguistics have observed that the elimination of the trigger for a rule creating an allophone [A] from the phoneme /B/ can cause the original allophone [A] to become the phoneme /A/, which then contrasts with /B/, e.g. Hoenigswald (1960), Hock (1986). That type of change (PHONEMIC SPLIT) is depicted in (29):

(29)

Phonemic split

/B/		>	/B/	/A/
[B]	[A]		[B]	[A]

One of the most celebrated examples of (29) is the historical rule of I-UMLAUT in German, a process that fronted back vowels before high front vocoids ([i] or [j]) in the following syllable (e.g. Twaddell 1938, Fulk 2018). At an earlier stage (OHG), back vowels had front vowel allophones before sounds like [i] (/i/), but at a later stage (MHG) that front vocoid trigger was reduced to schwa ([ə] /ə/) by a change I call Vowel Reduction. The latter change triggered the phonemicization of the original front vowel allophones, e.g. OHG [hy:ti] 'skin-PL' from /hu:t-i/ (cf. OHG [hu:t] /hu:t/ 'skin-SG') > MHG [hy:tə] from /hy:t-ə/. Significantly, the new front vowel phonemes contrasted with the corresponding back vowels before schwa, cf. MHG [kru:tə] 'herb-DAT SG' from /kru:t-ə/. This example illustrates the historical overapplication of i-Umlaut in examples like [hy:tə], which is counterbled by Vowel Reduction (recall the synchronic example in 11ii).

In this book I show how (29) can be applied to the historical fronting of velars. The relevant stages are depicted in (30), where VE and PA represent velar and palatal respectively. It is assumed here that Stage 2 – characterized by the presence of velar and palatal allophones – was preceded by a stage without the palatal allophone (Stage 1), although assumption is not crucial for the discussion below.

(30)

Three stages for velar fronting

Stage 1		Stage 2			Stage 3	
/VE/	>	/VE/		>	/VE/	/PA/
[VE]		[VE]	[PA]		[VE]	[PA]

The development in (30) needs to distinguish two types of palatals at Stage 3: In one type of system there was a phonemic split (as in 29) involving the creation of /Pa/ from the Stage 2 palatal allophone [Pa]. Significantly, that split led to a contrast between the velar and the corresponding palatal (e.g. /x/ vs. /ç/); hence, the velar and palatal occurred in the context of the same vowel. For example, in a dialect discussed in Chapter 9, [x] contrasts with [ç] after [ɑ] in [dɑx] (/dɑx/) 'roof' vs. [dɑç] (/dɑç/) 'dike'. The /ç/ in that type of example is referred to in the following chapters as a phonemic palatal, and the change leading to that segment is called Phonemicization.

Phonemic palatals (e.g. /ç/) have an opaque history because they can stand next to a back sound that was originally front. For example, in the variety referred to in the preceding paragraph, the [ç] surfacing after [ɑ] (e.g. in [dɑç] /dɑç/ 'dike') derived historically from the front vowel [iː], e.g. [dɑç] /dɑç/ < [diːç] /diːx/. Since the front trigger for the original rule of velar fronting (/iː/) is no longer present, the phonemicization of palatals involves the historical overapplication of velar fronting, which is counterbled by the historical change eliminating the front vowel trigger, namely /iː/ > /ɑ/; recall (11bii).

The change affecting the palatal allophone at Stage 2 in (30) can also lead to a different type of system, namely one with a palatal quasi-phoneme (depicted in 29 as /Pa/ at Stage 3).[23] Palatal quasi-phonemes were described briefly in §1.4.1: In that type of system palatals (e.g. [ç]) occur in the context of front vowels and in the context of some back vowels that were historically front (referred to here as [Bk]), but velars (e.g. [x]) surface in the context of all back sounds with the exception of [Bk]. Palatal ([ç]) and velar ([x]) do not contrast because they stand in complementary distribution. All instances of palatals in the context of [Bk] are quasi-phonemes (/ç/).

Palatal quasi-phonemes always have an opaque history because they are situated next to a sound ([Bk]) that was once front. For example, in a dialect discussed in Chapter 7, [ç] occurs after front vowels (e.g. [liçt] /lixt/ 'light') or after [ɑː] (e.g. [ʃlɑːçt] 'bad') and [x] after back vowels other than [ɑː] (e.g. [bux] /bux/ 'book'). Significantly, [ɑː] (/ɑː/) derived from earlier [ɛ] (/ɛ/). The vocalic change (/ɛ/ > /ɑː/) counterbled the historical process of velar fronting; recall (11bii).

From the synchronic perspective there are two palatal categories: (a) underlying palatals (e.g. /ç/) and (b) derived palatals (e.g. [ç] from /x/). Two examples illustrating (a) were discussed above, namely phonemic palatals and palatal

[23] Quasi-phonemes play a prominent role in the treatment of German i-Umlaut proposed by Kiparsky (2015), although his definition of quasi-phonemes is not quite the same as the one adopted in the present book; see §7.4.4 for discussion.

quasi-phonemes, although a third variant is discussed below. One example exemplifying (b) was referred to above, namely allophonic palatals (depicted at Stage 2 in 29). However, there are two other kinds of derived palatals that I discuss. Consider first systems with phonemic palatals. In the variety referred to above (from Chapter 9), [x] (/x/) and [ç] (/ç/) contrast after back vowels like [ɑ] in words like [dɑx] (/dɑx/) 'roof' vs. [dɑç] (/dɑç/) 'dike', but after front vowels only [ç] occurs. Since [ç] in the front vowel context is predictably palatal (because it does not contrast with [x] in that environment), it is derived from the velar /x/, e.g. [ʃlɛçt] 'bad' is /ʃlɛxt/. In that type of example, the [ç] in [ʃlɛçt] 'bad' is derived synchronically by velar fronting, which functions not as an allophonic rule, but instead as a NEUTRALIZATION. In systems with palatal quasi-phonemes there are likewise many examples exhibiting category (b) which are not allophonic palatals. In the dialect with palatal quasi-phonemes described above (from Chapter 7), palatals occurring in the front vowel context are derived by velar fronting (e.g. the word [liçt] 'light' is underlyingly /lixt/). However, velar fronting is not an allophonic operation because the same system has underlying palatals (/ç/) after [Bk] segments (e.g. in [ʃlɑːçt] 'bad'), nor is velar fronting a neutralization because there is no velar vs. palatal contrast. Instead, velar fronting in the type of system just described functions as a QUASI-NEUTRALIZATION.

The overwhelming number of palatals investigated here were etymological velars. First, there are those palatals described above that continue to be derived from velars in the synchronic phonology (DERIVED PALATALS). Second, there are underlying palatals (palatal quasi-phonemes, or phonemic palatals). But a third type of underlying palatal needs to be distinguished as well, namely the lenis fricative [ʝ] in words like [ʝɑː] 'yes', which is referred to below as the ETYMOLOGICAL PALATAL. That segment is different from all of the other types of palatals discussed above because of its unique history: The etymological palatal derived from the homorganic (palatal) glide [j] (/j/) by a change referred to below as Glide Hardening, e.g. [ʝɑː] /ʝɑː/ 'yes' < [jɑː] /jɑː/. The etymological palatal [ʝ] can occur in the context of a back vowel; however, that type of [ʝ] does not reflect opacity (overapplication) because it never derived from a velar.

In Table 2.6 I summarize the four kinds of palatals discussed above. Any type of palatal can belong to the first three categories (a-c), but category (d) is always either the lenis palatal fricative /ʝ/ or the fortis palatal fricative /ç/ if that sound derived historically from /ʝ/, e.g. [çɑː] /çɑː/ 'yes' < [ʝɑː] /ʝɑː/ < [jɑː] /jɑː/.

Derived palatals (=Table 2.6a) do not contrast with the corresponding velars in the context for fronting. This is clearly the case for allophonic palatals because those palatals stand in complementary distribution with the corresponding velars, but it is also true for palatals derived by neutralizations or quasi-

Table 2.6: Four types of palatals

	Contrasts with velar	Opaque history (counterbleeding)
a. Derived palatal (e.g. [ç] from /x/)	no	no
b. Phonemic palatal (e.g. /ç/)	yes	yes
c. Palatal quasi-phoneme (e.g. /ç/)	no	yes
d. Etymological palatal (e.g. /ɟ/)	yes/no	no

neutralizations. In the latter type of system there is no contrast at all between velar and palatal, which stand in complementary distribution. In the case of neutralizations there is a contrast between velar and palatal, although that contrast is virtually always in the context of one or more back vowel, but in the context of front vowels, only palatals surface. Derived palatals have a distribution that is transparent because they are the modern reflexes of earlier velars that fronted in the front vowel context. That historical rule of velar fronting is therefore still present as a synchronic process.

Phonemic palatals (=Table 2.6b) always contrast with the corresponding velars in at least one context. Phonemic palatals have an opaque history. This point can be illustrated in dialects like the one described above (from Chapter 9), in which those sounds arose due to the elimination of the front vowel trigger for the original palatal allophone, e.g. [dɑç] (/dɑç/) 'dike' < [diːç] (/diːx/). In that type of example, the historical rule of velar fronting overapplied because it is counterbled by a vocalic change (/iː/ > /ɑ/).

Palatal quasi-phonemes (=Table 2.6c) never contrast with the corresponding velars. Like phonemic palatals, they have an opaque history which always involves overapplication. Consider once again the dialect described above (from Chapter 7) in which [ç] surfaces after front vowels [liçt] /lixt/ 'light') or after [ɑː] (e.g. [ʃlɑːçt] 'bad') and [x] after back vowels other than [ɑː] (e.g. [bux] /bux/ 'book'). In that example the historical rule of velar fronting overapplied because it is counterbled by a vocalic change (/ɛ/ > /ɑː/).

The etymological palatal (=Table 2.6d) does not have an opaque history because it was never a velar. In some dialects that palatal does not contrast with the corresponding velar because that historical velar is no longer present. For example, in a dialect discussed in Chapter 4, the original glide [j] (/j/) underwent Glide Hardening in [ɟʊŋə] (/ɟʊŋə/) 'boy', but the original [ɣ] (/ɣ/) is now fortis [x] (/x/) in [xʊnst] (/xʊnst/) 'favor'; thus, the dialect does not contrast /ɟ/ and /ɣ/

because the latter sound does not occur word-initially. However, in other varieties the etymological palatal can contrast with the corresponding velar. This is the case in which a velar ([ɣ]) and the etymological palatal ([ʝ]) surface in the context of the same back vowels, e.g. in the pair [ɣɑt] (/ɣɑt/) 'hole' vs. [ʝɑː] (/ʝɑː/) 'yes' present in a dialect discussed in Chapter 8. Since the etymological palatal contrasts with the corresponding velar in that type of system, the former sound is also a phonemic palatal.

2.4.4 Polycausality in language change

There is little question that velar fronting has a structural (phonological) motivation, a point that is hardly controversial when one examines the literature on this topic cited earlier. The structural reason for the fronting of velars is clear when one considers the targets and triggers for the process: A back sound (velar) is realized as palatal in the neighborhood of a front segment. Any assimilatory process like this one has a structural cause, which is captured in the present framework with the spreading of the feature [coronal]; recall (5).

This point aside, it has to be acknowledged that there may be nonstructural (social) factors that also contribute to the fronting of velars in the neighborhood of front sounds. For example, in a set of dialects discussed in Chapter 11 once spoken in the eastern part of pre-1945 Germany some of the palatal sounds created by velar fronting (e.g. the palatal stop [c]) also occurred in (non-Germanic) loanwords acquired from (Slavic) languages spoken in the direct vicinity of the German dialects with the palatal stops in question. In that chapter I conclude that contact with non-Germanic languages in the form of Slavic loanwords with palatal sounds probably went hand-in-hand with velar fronting. This scenario suggests that the proper explanation of velar fronting for those varieties of German needs to take social factors (language contact) into account, in addition to structural (phonological) ones. The term I use to describe this state of affairs is POLYCAUSALITY.

The connection between social and the structural factors with respect to velar fronting is mostly unexplored, although some reference to social factors can be found the literature I refer to below. For example, in one study I cite in §12.3.2 a connection is fleetingly mentioned between the choice of triggers for postsonorant velar fronting and religious affiliation (Catholics vs. Protestants). By contrast, one issue that has received considerable attention in recent years is alveolopalatalization as a marker for various ethnolects (§10.6.1).

It is not difficult to find parallel cases involving polycausality in the literature on language change. One well-known example that comes to mind is the phonemicization of lenis (voiced) fricatives in the history of English ([v z ð]); see §8.6.1 and §11.8.2. The literature on this topic is in agreement that that the structural (phonological) reason for the change from fortis to lenis was reinforced by the occurrence of French loanwords with those sounds.

Aside from the dialects referred to above the sources cited in this book do not present evidence that social factors play a role in velar fronting. For this reason, polycausality is a topic that only plays a minor role in this book.

2.5 The historical model

The case studies presented in the ensuing chapters reveal that velar fronting can differ synchronically from dialect to dialect in terms of targets and triggers and in terms of the presence or absence of opacity. I argue that those synchronic areal differences reflect the ways in which the originally phonetically-induced fronting of velars was phonologized and then gradually became embedded into the grammar of individual dialects. In particular, the German dialects support a model in which velar fronting exhibits the LIFE CYCLE depicted in Figure 2.2. The claim that rules can have a life cycle is well-established, although the individual models differ from author to author, e.g. Baudouin de Courtenay (1895 [1972]), Hyman (1976), Dressler (1976), Kiparsky (1995), Bermúdez-Otero (2007), Roberts (2012), Hyman (2013), Kiparsky (2015), Bermúdez-Otero (2015), Ramsammy (2015), Sen (2016), Turton (2017), and Hinskens (2021).

$$\begin{array}{ll} \text{Stage 3:} & \text{Opaque (velar fronting under- or overapplies)} \\ \uparrow & \\ \left\{\begin{array}{c}\text{Stage 2n(n)}\\ \uparrow \\ \text{Stage 2a(a)}\end{array}\right\} & \text{Allophonic (velar fronting is transparent)} \\ \uparrow & \\ \text{Stage 1:} & \text{Phonetic (coarticulation)} \end{array}$$

Figure 2.2: The life cycle of velar fronting

Phonologization (not depicted above) refers to the change from a gradient phonetic process (Stage 1) to a categorical phonological rule producing palatal allophones (Stage 2). I describe the subscripts for Stage 2 indicated in Figure 2.2 below.

The focus of the present work falls squarely on Stage 2 and Stage 3. I make first some brief remarks on Stage 1.

2.5.1 Stage 1

A number of linguists have observed that it is common for a velar like /k/ to be articulated in a slightly more forward position along the palate in the neighborhood of front vowels than in the neighborhood of back vowels. One of the first to my knowledge was Sapir (1921: 52), who compared the realization of English /k/ in *keep* and *cool*. The coarticulatory fronting of velars like /k/ in the context of front vowels (especially /i/) represents Stage 1. That the fronting described here is gradient is the conclusion drawn by Keating & Lahiri (1993), who consider articulatory and acoustic data involving the realization of velars in the neighborhood of various vowels in English and other languages.

I claim that there was an earlier point in the history of Gmc when velar fronting was not present (Stage 1). At that time, velar sounds like /x/ succumbed to coarticulatory fronting in the context of one or more front vowel, which probably served as the impetus for Stage 2. I refer henceforth to this phonetically fronted velar as a PREVELAR and represent it in a narrow phonetic transcription with the IPA diacritic for an advanced articulation, e.g. [k̟] for a prevelar stop and [x̟] for a prevelar fricative; see §12.9.1 for some discussion of prevelars.

It is not possible to provide evidence for coarticulatory velar fronting (prevelars) in the broad spectrum of German dialects I investigate because the sources for those dialects do not provide that information.

2.5.2 Stage 2

The difference between phonetically fronted velars (prevelars) in the context of front vowels and plain velars in the context of back vowels (Stage 1) is eventually exaggerated to the point where speakers perceive of the two consonants as different sounds. At that point (Stage 2) those two sounds are realized as palatal (e.g. ich-Laut) and velar (e.g. ach-Laut).

Since velars and palatals do not contrast at Stage 2, those segments stand in complementary distribution; thus, [ç] and [x] are allophones of the phoneme /x/, whose realization as palatal is expressed formally with a specific version of velar fronting (recall 4). Hence, phonologization (Stage 2) can be thought of as RULE ADDITION in the sense that velar fronting is present in the Phonology component (Table 2.1) but was absent in the Phonology at Stage 1. Once in the grammar at Stage 2 that synchronic process remains active until it is modified in light of the various changes involving triggers and targets discussed below.

Stage 2 consists of a series of stages expressed with the subscripts in Figure 2.1, i.e. (a) and (n). These incremental steps are intended to reflect the rule generalization model described above (Figure 2.1): The newly phonologized rule of velar fronting gradually incorporates a greater number of targets and/or triggers and when it does so, it enters into the immediately following stage. Figure 2.3 illustrates how the set of triggers for postsonorant velar fronting grows from Stage 2a (high front vowels, represented here as /i/) to Stage 2b (nonlow front vowels, represented by /i/ and /e/). The vowel /ɑ/ represents all back vowels. Stage 2n represents the point with a broader set of triggers than the nonlow front vowels (see Chapter 12). Note that the output of velar fronting ([ç]) throughout Stage 2 is the derived palatal from Table 2.6(a).

Stage 2n: /ix/ [iç], /ex/ [eç] .... /ɑx/ [ɑx]
↑
Stage 2b: /ix/ [iç], /ex/ [eç] .... /ɑx/ [ɑx]
↑
Stage 2a: /ix/ [iç], /ex/ [ex] .... /ɑx/ [ɑx]
↑
Stage 1: /ix/ [ix], /ex/ [ex] .... /ɑx/ [ɑx]

Figure 2.3: Stage 1 and Stage 2 (for triggers) in the life cycle of velar fronting

Synchronically the rule of velar fronting at Stage 2a spreads the frontness feature ([coronal]) from a high front vowel ([−consonantal, +high, coronal]) to a velar target (/x/). At Stage 2b that rule is broadened, so that [coronal] spreads from a nonlow front vowel ([−consonantal, −low, coronal]).

Figure 2.4 shows that the initial target for postsonorant velar fronting (Stage 2aa) is fortis /x/ and that at a later point (Stage 2bb) the lenis counterpart /ɣ/ is incorporated as a target segment as well. Stage 2nn refers to the point when additional velar consonants serve as triggers (e.g. /k/). Dialects with the broadest set of targets are discussed in detail in Chapter 11.

Stage 2nn: /ix/ [iç], /iɣ/ [iʝ] ....
↑
Stage 2bb: /ix/ [iç], /iɣ/ [iʝ] ....
↑
Stage 2aa: /ix/ [iç], /iɣ/ [iɣ] ....
↑
Stage 1: /ix/ [ix], /iɣ/ [iɣ] ....

Figure 2.4: Stage 1 and Stage 2 (for targets) in the life cycle of velar fronting

From the synchronic perspective the rule of velar fronting at Stage 2aa had a target defined as the features for /x/ ([+consonantal, −sonorant, +continuant, +fortis, dorsal], but that set of features is modified for the synchronic rule at Stage 2bb ([+consonantal, −sonorant, +continuant, dorsal]).

The changes from a narrow to broad set of triggers (Figure 2.3) and targets (Figure 2.4) need not match up. Put differently, velar fronting is phonologized at Stage 2a for triggers and Stage 2aa for targets, but some dialects extend the set of triggers at a faster rate than the set of targets. This accounts for the fact that many varieties of HGm/LGm are attested with the narrowest set of targets (/x/) but with the broadest set of triggers (coronal sonorants); see Chapter 12.

Data documenting the gradual spread from specific to general targets/triggers (Figures 2.3 and 2.4) along the time dimension alone are not known to me. That type of evidence would consist of a description of velar fronting in a specific place at a specific time as well as a parallel set of data from the same place but at a later point in time. Since I am not aware of such longitudinal studies I focus instead on the place dimension. That type of evidence consists of a comparison of the description of velar fronting in one place with data in a neighboring place where both dialects were spoken at roughly the same general time frame. By comparing dialects spoken in different places at approximately the same time it is possible to draw conclusions on how velar fronting progressed along the temporal dimension.

As described in §2.4.1 the gradual spread of triggers and targets as depicted in Figures 2.3 and 2.4 occurred in time and space. In that section I discussed how temporal and spatial spreading go hand in hand (Figure 2.1). The extension of targets and triggers in space is not expressed in Figure 2.2, which only indicates the time dimension.

Figure 2.2 does not mean to suggest that the originally gradient fronting of velars (Stage 1) is simply replaced by the categorical rule of velar fronting (Stage 2). Instead, it is conceivable that Stage 2 has both a phonological fronting of velars which was the outgrowth of an earlier coarticulatory fronting still present in the same dialect. For example, it might be the case that /x/ once underwent coarticulatory fronting (Stage 1). Later on velar fronting was phonologized with /x/ as the sole target segment (Stage 2), but for those same speakers other velar sounds (e.g. /k/) continued to undergo gradient fronting (Stage 1). Alternatively, the gradient fronting of /x/ after front vowels (Stage 1) was phonologized as the corresponding palatal after front vowels (Stage 2), but word-initially /x/ is still at Stage 1. See Turton (2017), who shows /l/ can show both gradient velarization and categorical velarization in varieties of English. Since the descriptions for German dialects on which my analysis is based do not have information on coarticulatory fronting it is not possible to draw conclusions concerning the scenario described above.

A contentious issue in historical linguistics is the locus of sound change. This topic is discussed in several chapters in Honeybone & Salmons (2015b) and summarized in Honeybone & Salmons (2015a: 8–9). One aspect of this debate involves the relationship between historical change and language acquisition. Some linguists (e.g. Hale et al. 2015) contend that all change is intergenerational. This means that children derive a grammar which is different from adults. According to this point of view, all language change occurs in acquisition. That approach can be contrasted with the one adopted by other scholars; for example, it has alternatively been argued that some (but not all) change occurs in acquisition, or that some change can occur within the lifespan of adults.

A related question is the extent to which sound change is driven by the listener, a topic discussed at length in the works of John Ohala (e.g. Ohala 1981 and numerous subsequent works). The same type of approach is adopted in various theoretical frameworks by many other linguists, including – but not limited to – Holt (1997), Hume & Johnson (2001), and Hamann (2009). The role of the listener in sound change is also a central claim in the Evolutionary Phonology framework (Blevins 2004). Although the authors cited here do not endorse exactly the same model, they agree that sound change can occur when a listener misperceives sounds uttered by a speaker.

In my treatment of velar fronting I assume a model whereby change is intergenerational and listener-driven. In particular, it involves the interaction between the speaker and the listener in acquisition. The way in which original velars like /x/ are misperceived as palatals is described briefly below. This treatment follows closely the source of sound change Blevins (2004: 32–34) refers to as CHANGE.

My approach can be applied to Figure 2.3 in the following manner: Stage 1 represents an adult speaker (P_1) and Stage 2 the child acquiring the language (P_2). P_1 utters a word with the vowel [i] followed by the dorsal fricative [x] – realized in Speech (Table 2.1) as prevelar ([x̟]), – but P_2 hears the palatal fricative [ç] and therefore pronounces the word as [iç]. The change from Stage 1 to Stage 2a therefore involves a subtle pronunciation change due to P_2's misperception of a sound uttered by P_1.

What is more significant than the mere change in pronunciation from Stage 1 (=P_1) to Stage 2a (=P_2) is P_2's interpretation of the new sound [ç] as a phonological unit – the ich-Laut – and not a phonetic one. This means that P_2 classifies [ç] as a palatal fricative with a unique featural representation (=1d). Since that sound has a distribution restricted to the context after [i], P_2 analyzes [ç] as an allophone of the corresponding velar ([x]), which never occurs in that context. This is accomplished by acquiring the phonological rule of velar fronting with the narrowest set of triggers (only before /i/).

The addition of triggers and targets to the newly acquired rule of velar fronting follow the same approach described above. For example, in Figure 2.4, Stage 2aa represents the grammar of an adult speaker (P_1) who has phonologized velar fronting for the target /x/ and the trigger /i/. When P_1 utters words with [i] followed by the (prevelar) lenis fricative /ɣ/, that sound is misperceived by the acquirer at Stage 2bb (P_2), who hears the palatal fricative [ʝ] and then treats it as a phonological unit on par with [ç].

In the remainder of this book I make extensive references to the various stages referred to above – stages which are made more explicit in Chapters 12 and 13. It needs to be stressed that terms like "Stage 1", "Stage 2a" etc. in Figures 2.3 and 2.4 are simply a different way of saying that sound change occurs in acquisition between speakers and listeners.

When velar fronting is phonologized at Stage 2a/Stage 2aa it enters the grammar as a regular rule that has no exceptions; thus, there is no evidence for LEXICAL DIFFUSION (Chen & Wang 1975, Kiparsky 1995, Phillips 2006). Evidence for my claim that velar fronting is regular is that the data provided in the original sources give no indication at all that velar fronting is (or that it ever was) irregular. Hence, velar fronting is a classic example of a Neogrammarian change. From the diachronic perspective, velar fronting is phonologized (acquired) at Stage 2 by the younger generation as a regular sound change. My assumption that sound change is regular and exceptionless holds not only for velar fronting, but also for the changes that interact with velar fronting which I discuss in ensuing chapters.[24]

A major topic discussed in Chapters 3–11 is the way in which velar fronting interacts with synchronic and diachronic processes increasing or decreasing the number of potential targets and/or triggers for velar fronting. Table 2.7 lists the four logical possibilities (second column), which are referred to below with the abstract designations in the first column.

In Chapters 3–10 I discuss a number of specific examples of synchronic and diachronic processes corresponding to Rule W, X, Y, and/or Z, as defined above. I describe below the most common patterns.

When velar fronting is phonologized (Stage 2) it always interacts transparently with Rules W-Z (if present); hence, velar fronting is added at the end of

[24] Lexical exceptions to velar fronting are not attested in any dialect of German. For discussion see §5.2, §12.8.3, and §13.5.3.

Table 2.7: Rules increasing/decreasing potential targets and/or triggers for velar fronting

Abstract rule	Definition	Example
Rule W	Increases the number of potential velar targets	A non-velar segment is realized as velar in the context for velar fronting
Rule X	Increases the number of potential front segment triggers	A back sound is realized as front in the context for velar fronting
Rule Y	Decreases the number of potential velar targets	A velar target (e.g. /x/) deletes or converts to another sound in the context for velar fronting
Rule Z	Decreases the number of potential front segment triggers	A front trigger (e.g. /i/) deletes or converts to a back sound in the context for velar fronting

the grammar and is either fed or bled by Rule W-Z. This means that the palatals produced by the synchronic rule of velar fronting for Stage 2 speakers only occur in the neighborhood of front sounds, and velars in the neighborhood of back sounds. In Figures 2.5 and 2.6 I show the transparent interaction of synchronic rules for four hypothetical dialects; specific examples exemplifying those four systems are discussed in Chapters 3 and 4. In Figures 2.5 and 2.6 /i e/ and /u o ɑ/ represent front and back vowels respectively. "/A/" is a cover symbol for any segment other than /x/, and Vel Fr = (postsonorant) velar fronting.

	Dialect A				Dialect B		
	/ɑx/	/iA/	/ix/		/ɑx/	/ix/	/ux/
Rule W	---	ix	---	Rule X	---	---	ix
Vel Fr	---	iç	iç	Vel Fr	---	iç	iç
	[ɑx]	[iç]	[iç]		[ɑx]	[iç]	[iç]

Figure 2.5: Velar fronting fed by Rule W/Rule X in the synchronic phonology

Dialect A has a process converting /A/ into the fortis velar fricative. Since that synchronically derived fricative undergoes velar fronting, the latter process is fed by /A/⟶[x]. /A/⟶[x] illustrates Rule W (Table 2.7) because it increases the number of target segments for that process. Dialect B possesses a synchronic rule creating a front vowel from a back vowel. That process exemplifies Rule X (Table 2.7) because it increases the number of triggers for velar fronting. Rule X feeds velar fronting because it creates a structure ([i]) to which velar fronting can apply.[25] Figure 2.6 illustrates a synchronic bleeding relationship.

	Dialect C				Dialect D		
	/ɑx/	/ix/	/ix-ə/		/ɑx/	/ix/	/ex/
Rule Y	---	---	iAə	Rule Z	---	---	ox
Vel Fr	---	iç	---	Vel Fr	---	iç	---
	[ɑx]	[iç]	[iAə]		[ɑx]	[iç]	[ox]

Figure 2.6: Velar fronting bled by Rule Y/Rule Z in the synchronic phonology

Dialect C has a synchronic process for the example /ix-ə/, which converts a velar fronting target (/x/) into another sound ([A]) in the context between vowels. The rule /x/⟶[A] exemplifies Rule Y (Table 2.7) because it decreases the number of target segments for velar fronting. Rule Y in Dialect C therefore bleeds velar fronting. In Dialect D there is a rule converting certain triggers for velar fronting (e.g. /e/) into back sounds. That rule (/e/⟶[o]) exemplifies Rule Z (Table 2.7) because it decreases the number of potential front triggers for velar fronting. In that example Rule Z bleeds velar fronting.

The four systems depicted in Figure 2.5 and Figure 2.6 are also attested when Rules W-Z are diachronic processes that restructure underlying representations. Figure 2.7 depicts the two most common diachronic patterns, which are referred to here as Dialect E and Dialect F.

It can be seen in the three examples to the left of the wedge in Dialect E that velar fronting is active synchronically and that the outputs are transparent. Sound change occurs in Dialect E, namely /ou/ > /ei/. That change involves a restructuring of the underlying representation because there are no alternations between those two diphthongs [ou] and [ei] that would motivate treating it as a synchronic rule. The phonetic representations to the right of the wedge

[25] As indicated in Figure 2.5 the segment undergoing Rule W in Dialect A is present in the underlying representation (/iA/). It some of the case studies discussed below the target for Rule W (i.e. /A/) can itself be synchronically derived from another segment. The same point holds for the back vowel in Dialect B which undergoes Rule X. That back vowel (/u/ in Figure 2.5) can be present in the underlying representation, or it can alternatively be derived from an independent rule.

Dialect E							Dialect F						
/ɑx/	/ix/	/oux/	>	/ɑx/	/ix/	/eix/	/ɑx/	/ix/	/eix/	>	/ɑx/	/ix/	/oux/
[ɑx]	[iç]	[oux]		[ɑx]	[iç]	[eiç]	[ɑx]	[iç]	[eiç]		[ɑx]	[iç]	[oux]

Figure 2.7: Velar fronting fed/bled by Rule X/Rule Z in the diachronic phonology

reveal that velar fronting is still active as a Stage 2 rule. The significance of this example is that the sound change /ou/ > /ei/ feeds velar fronting in the final example. The diachronic change /ou/ > /ei/ exemplifies Rule X (Table 2.7) because it increases the number of triggers for velar fronting. Dialect F illustrates the opposite diachronic change, namely /ei/ > /ou/. The three examples to the left of the wedge show that velar fronting is active synchronically before the restructuring of /ei/. After the restructuring (to the right of the wedge) velar fronting is still active synchronically, but there is one less trigger because /ei/ was eliminated by the sound change /ei/ > /ou/. Since that sound change decreases the number of triggers it exemplifies Rule Z (Table 2.7).

2.5.3 Stage 3

This is a cover term referring to the point when: (a) some velars surface unexpectedly as velars in the context of velar fronting (underapplication); or (b) some palatals deriving historically from velars occur unexpectedly in the back vowel context (overapplication).

I consider underapplication and overapplication in order. There are two types of underapplication (aa and ab), which are described here:

2.5.3.1 Stage 3aa

An independent process (Rule W) creates new segments which can potentially undergo velar fronting. Since those new velars fail to undergo velar fronting, the latter process is counterfed by Rule W. In the case studies exemplifying (aa) discussed in Chapter 5 both velar fronting and Rule W are active synchronically. (aa) is depicted in Figure 2.8.

The examples /ix/ and /ɑx/ illustrate that velar fronting is active synchronically, since /x/ is realized as palatal after front vowels like /i/ and as velar after back vowels like /ɑ/. By contrast, the realization of the underlying representation /iA/ as [ix] exemplifies underapplication (aa) because Rule W (/A/⟶[x]) counterfeeds velar fronting. Note the difference between Dialect G in Figure 2.8 and

	Dialect G		
	/iA/	/ix/	/ɑx/
Vel Fr	---	iç	---
Rule W	ix	---	---
	[ix]	[iç]	[ɑx]

Figure 2.8: Rule W counterfeeds velar fronting in the synchronic phonology

Dialect A depicted in Figure 2.5. In Chapter 5 I discuss opaque systems like Dialect G in Figure 2.8 and show that they developed out of the transparent ones like Dialect A in Figure 2.5.[26]

2.5.3.2 Stage 3ab

A historical process (Rule X) creates new front vowels which can potentially serve as triggers for velar fronting. Since those new front vowels fail to induce velar fronting, the latter process is counterfed historically by Rule X. In the case studies discussed in Chapter 6 illustrating (ab), Rule X is no longer active synchronically. Instead, it has the effect of restructuring underlying representations for a younger generation of speakers to the ones depicted in (27b) for neutral vowels. Figure 2.8 illustrates (ab).

Dialect H

Stage 2				Stage 3		
/oux/	/ix/	/eix/	>	/øix/	/ix/	/eix/
[oux]	[iç]	[eiç]		[øix]	[iç]	[eiç]

Figure 2.9: Rule X counterfeeds velar fronting in the diachronic phonology

In this example there is a historical process (/ou/ > /øix/) that creates new front vowels that are potential triggers for velar fronting. Since those new front vowels do not feed velar fronting, the latter is counterfed by the change from /ou/ to /øi/ (Rule X).

There are two very similar types of overapplication (=ba and bb), which are described in order.

[26]In Figure 2.8 it can be seen that the target segment for Rule W (i.e. /A/) is present in the underlying representation. In one set of dialects discussed in Chapter 5 it is shown that the target for Rule W can itself be synchronically derived from another sound. Recall Map 25.

2.5.3.3 Stage 3ba

A historical process (Rule Z) eliminates triggers for velar fronting, but that change fails to bleed velar fronting. An example of Rule Z is the change from any unstressed vowel (including crucially front vowels) to schwa (/ə/) in an unstressed syllable. This change is illustrated in Figure 2.10, which is well-attested in the varieties discussed in Chapter 7. At Stage 2 velar fronting is active in word-initial position. When /i/ changes to /ə/ the palatal remains even though schwa would be expected to be preceded by [x]. Ellipsis ('…') in the first example at Stage 2 and Stage 3 means that there is a part of the word containing a stressed vowel.

Dialect I

Stage 2				Stage 3		
/xi…/	/xe/	/xɑ/	>	/çə…/	/xe/	/xɑ/
[çi…]	[çe]	[xɑ]		[çə…]	[çe]	[xɑ]

Figure 2.10: Opacity (overapplication) in the creation of palatal quasi-phonemes

When unstressed front vowels like /i/ are restructured to /ə/ for the next generation those speakers also reanalyze the palatal allophone [ç] from Stage 2 as an underlying palatal (/ç/) because the trigger for velar fronting has been eliminated. The underlying palatal /ç/ at Stage 3 is a palatal quasi-phoneme (=Table 2.6c) because there is no contrast between velars and palatals in the context before schwa, where only [ə] occurs.

2.5.3.4 Stage 3bb

In this type of system there is a historical process (Rule Z) which eliminates triggers for velar fronting, but that change does not bleed velar fronting. An example of Rule Z attested in the dialects discussed in Chapter 9 is the replacement of a diphthong ending in a front vowel with a back monophthong (/ɑi/ > /ɑ/); see Figure 2.11.

Dialect J

Stage 2				Stage 3		
/ɑx/	/ix/	/ɑix/	>	/ɑx/	/ix/	/ɑç/
[ɑx]	[iç]	[ɑiç]		[ɑx]	[iç]	[ɑç]

Figure 2.11: Opacity (overapplication) in the creation of phonemic palatals

When /ɑi/ is restructured to /ɑ/ at Stage 3 speakers have no alternative but to reanalyze the palatal allophone [ç] from Stage 2 as an underlying palatal (/ç/) because the trigger for velar fronting is no longer present. The underlying palatal at Stage 3 is a phonemic palatal (= Table 2.6b) because it contrasts with [x] after the vowel [ɑ]. Concrete examples of German dialects exemplifying Dialect J are discussed in Chapter 9.

The two overapplication outcomes (ba and bb) do not imply that velar fronting is lost at Stage 3. This point can be illustrated by considering Stage 3 for Dialect J in Figure 2.11. [ç] is clearly an underlying palatal (/ç/) in the context after back vowels like /ɑ/; however, [ç] can still be synchronically derived from /x/ in the context of front vowels (e.g. in [iç] from /ix/) because only [ç] but not [x] occurs in that context. In Dialect J the transition from Stage 2 to Stage 3 therefore entails two changes for velar fronting. First, the original palatal allophone for the older generation is reanalyzed as an underlying palatal for the younger generation. The change from a derived palatal (=Table 2.6a) at Stage 2 to an underlying palatal (=Table 2.6b or Table 2.6c) comes about because the original trigger for velar fronting is lost. Second, velar fronting undergoes the change from an allophonic process (Stage 2) to a neutralization (Stage 3).

The four opaque systems described above (aa, ab, ba, bb) are not mutually exclusive. A single dialect can therefore have more than one opaque sound. For example, several varieties of German are attested with palatal quasi-phonemes (=ba) and phonemic palatals (=bb). Likewise one of the varieties of German with a counterfeeding order (=aa) also has a palatal quasi-phoneme (ba).

What is not expressed in the historical model in Figure 2.2 is the phonemicization of palatal fricatives that were not the product of earlier velars. The type of segment referred to here is the etymological palatal (/ʝ/) from Table 2.6(d). Since the palatal fricative (/ʝ/) in question derives from an earlier palatal glide (i.e. [j] (/j/), the change from the latter to the former by Glide Hardening does not involve a change that counterbleeds or counterfeeds velar fronting. The change /j/ > /ʝ/ is not a part of Figure 2.2 because there is no transparency and/or opacity. However, it is shown in Chapter 8 that Glide Hardening often results in a phonemic contrast between palatals (/ʝ/ from earlier /j/) and velars (inherited /ɣ/).

One of the parameters mentioned earlier (output of velar fronting) is not indicated in Figure 2.2. Recall that there are two different outcomes for a /x/ target: nonsibilant palatal [ç] or sibilant alveolopalatal [ɕ]. Alveolopalatalization requires two modifications to the Stage 2 system with the allophones [x] and [ç]. First, [ç] is realized for innovative speakers as the new allophone [ɕ] which is phonetically and phonologically distinct from the inherited postalveolar [ʃ] (/ʃ/). Second, [ɕ] and [ʃ] merge for the next generation to [ɕ], which is phonemic (/ɕ/)

because it contrasts with [x] (/x/) in the context after a back vowel. That merger does not exhibit opacity because the new phoneme /ɕ/ in the context after a back vowel did not derive historically from a velar (but instead from the coronal [ʃ]).

It is argued that alveolopalatalization ([ç ʃ] > [ɕ]) is not expressed in terms of phonological rules; hence the realization of /x/ as [ɕ] is captured formally with the same rule of velar fronting (=5a) that produces [ç] from /x/. That the output of velar fronting is realized first as a nonsibilant and then only later as a sibilant is expressed not in the phonology, but instead with rules of phonetic implementation.

In the model in Figure 2.2 change only occurs from bottom to top, where Stage 1 develops into Stage 2 and Stage 2 into Stage 3, but never in the opposite direction. However, the evidence discussed below indicates that the rule at Stage 3 must not necessarily have passed through each of the individual steps at Stage 2. For example, in one HGm dialect with neutral vowels the set of triggers for velar fronting consists only of high front vowels (Chapter 6). This suggests that the opaque effects (i.e. the creation of neutral vowels) occurred at a very early point at Stage 2 (i.e. Stage 1a), before the set of triggers for velar fronting could expand to include all front vowels. Likewise in one LGm dialect, velar fronting only applies after nonlow front vowels (Stage 1b), but that same rule of velar fronting is counterfed by another rule, as in Dialect C from Figure 2.6.

On the basis of the synchronic material from German dialects it can be deduced that there could not have been a single focal area for velar fronting. Instead, the evidence points to several different points of origin; see §12.5.2 and especially §16.4. This means that the historical model in Figure 2.2 (including rule generalization in Figure 2.1) occurred independently at various places in the German-speaking world. Polygenesis derives additional support from in alveolopalatalizing dialects, since it can be shown that alveolopalatalization (Table 16.6) occurred in places surrounded by non-alveolopalatalizing dialects (§10.6.1).

In Chapter 5 – Chapter 15 I discuss the synchronic and diachronic behavior of fronted palatals in a wide selection of HGm and LGm dialects, although I do not show how the historical process of velar fronting fits into the established stages in the history of German (Appendix E). Linguistic evidence is adduced in later chapters that velar fronting must have been phonologized at a very early stage, namely either in OHG (750–1050) or OSax (800–1150), although phonologization in some dialects may have postdated that time frame. The dating of velar fronting is discussed in Chapter 16.

3 Allophony (Part 1)

3.1 Introduction

The present chapter investigates German dialects in which a velar (e.g. [x]) and the corresponding palatal ([ç]) stand in complementary distribution and therefore never contrast. The relationship between velar and palatal is an allophonic one, which is captured by deriving the latter synchronically from the former by specific versions of velar fronting. There are no palatal fricatives in the neighborhood of back segments, nor are there velar fricatives in the context of front segments; hence, palatals like [ç] only surface in the context specified in the structural description of velar fronting and the velar only in the elsewhere case; see Stage 2 in Figure 2.2. Velar and palatal fricatives in the dialects discussed below have a transparent distribution; hence, velar fronting is fed or bled by processes altering the number of potential targets or triggers for velar fronting.

Dialects with an allophonic distribution of [x] and [ç] are important to discuss in detail because velars and palatals pattern differently in other varieties of German. For example, many dialects are attested with palatal quasi-phonemes (Chapter 7) or phonemic palatals (Chapter 8 – Chapter 10). The material investigated below can therefore serve as a basis of comparison for the data discussed in later chapters.

In this chapter and in Chapter 4 I show that velar fronting applies synchronically at the end of the grammar in several diverse dialects. It is assumed here that the synchronic relationship involving rules feeding or bleeding velar fronting (Rules W-Z from Table 2.7) mirrors the diachronic relationship. Thus, if Rules W-Z feed or bleed velar fronting synchronically, then Rules W-Z were present in that dialect before velar fronting was phonologized, and the synchronic state therefore implies that velar fronting was phonologized at the end of the grammar. Independent linguistic (or philological) evidence confirming that velar fronting was phonologized later than the specific processes corresponding to Rules W-Z in the case studies discussed in this chapter and in Chapter 4 is sparse. See §5.5.2 for some discussion.

Although varieties of German displaying allophony between velar and palatal are not restricted to one particular area, it is nevertheless possible to state at the outset that such systems are particularly common in Almc and Bav. This chapter therefore focuses on several specific varieties belonging to those two broad dialects, namely Swb in §3.2, HAlmc in §3.3, §3.4, and CBav in §3.5, §3.6. I make some concluding remarks in §3.7.

3.2 Swabian

I focus on the description of a Swb dialect spoken in a specific region, although as I note below the same rule of velar fronting in that variety can be found not only in other UGm-speaking communities, but more generally in many places in the German-speaking dialect continuum. The distribution of [x] and [ç] in this one corner of Southwest Germany can therefore be thought of as the default pattern.

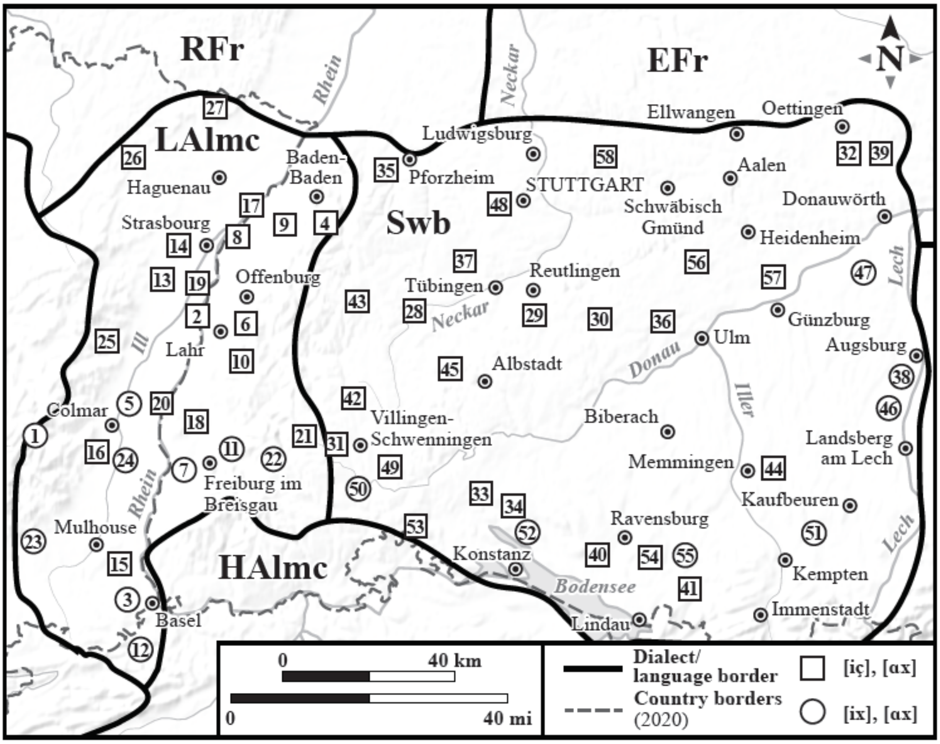
Besch (1961) provides a detailed overview of the sounds in a variety of Swb spoken in a broad area between the Neckar and Danube Rivers ('Neckar- und Donaugebiet') in the German state of Baden-Württemberg (Footnote 3.1).[1] The author focuses on the town of Erdmannsweiler, although he also considers other communities in the same region. For simplicity I refer to the dialect described by Besch as Erdmannsweiler.

In all of the case studies presented in this book it is essential to know the phonemic vowels. This is especially true of the front vowels, since those segments serve as potential triggers for the assimilation of an adjacent velar to palatal. For this reason, I attempt here and in all subsequent case studies to give a representative example for the realization of dorsal fricatives in the context of every phonemic vowel.

The phonemic monophthongs of Erdmannsweiler consist of the front vowels /iː i eː e æː æ/ and the back vowels /uː u oː o ɔː ɔ ɑː ɑ ə/. The two vowels /æː æ/ are transcribed in the original source as ⟦ā̈ ä⟧[2]. I interpret those two vowels as low ([æː æ]) and not mid ([ɛː ɛ]) because they are characterized by a degree of openness ('weit offen') greater than the degree of openness for vowels like [ɛ]

[1] The sources referred to under Footnote 3.1 and under all other locator maps are indicated with the corresponding number as circles (representing the absence of postsonorant velar fronting) or squares (representing the presence of some version of postsonorant velar fronting). The phonetic symbols in the legend for velars ([x]), palatals ([ç]) and triggers ([i ɑ]) are not intended to express the different types of triggers (e.g. nonlow front vowels vs. all front vowels), targets (e.g. /x/ vs. /x ɣ/), and/or outputs (e.g. [ʝ] vs. [ç] vs. [ɕ]).

[2] Throughout this book I enclose phonetic transcriptions as they appear in all original sources within double square brackets ⟦ … ⟧. My own transcriptions (with a consistent set of phonetic symbols) are given in single square brackets […]. The latter transcription is important because the original sources cited in this book employ a wide variety of symbols, some of which are not obvious to linguists in the present day.



Map 3.1: Low Alemannic (LAmc) and Swabian (Swb). Squares indicate postsonorant velar fronting and circles no velar fronting. 1=Mankel (1886), 2=Heimburger (1887), 3=Heusler (1888), 4=Heilig (1897) 5=Henry (1900), 6=Schwend (1900), 7=Ehret (1911), 8=Weik (1913), 9=Wasmer (1915), Wasmer (1916), 10=Kilian (1935), 11=Eckerle (1936), 12=Schläpfer (1956), 13=Keller (1961) (Barr), 14=Philipp (1965), 15=Bethge & Bonnin (1969), 16=Zeidler (1978), 17=Schrambke (1981), 18=Klausmann (1985a), Klausmann (1985b), 19=Rünneburger (1985), 20=Philipp & Bothorel-Witz (1989), 21=E.M. Hall (1991) (Urach), 22=E.M.Hall (1991) (Titisee-Neustadt), 23=ALA (Mortzwiller), 24=ALA (Oberhergheim), 25=ALA (Thanvillé), 26=ALA (Weiterswiller), 27=ALA (Lembach), 28=Kauffmann (1887), 29=Wagner (1889), 30=Bopp (1890), 31=Haag (1898), 32=Schmidt (1898), 33=Müller (1911), 34=Dreher (1919), 35=Sexauer (1927), 36=Strohmaier (1930), 37=Zinser (1933), 38=Moser (1936), 39=Nübling (1938), 40=Schöller (1939), 41=Bausinger & Ruoff (1959), 42=Besch (1961), 43=Baur (1967), 44=Hufnagl (1967), 45=Bethge & Bonnin (1969), 46=König (1970), 47=Ibrom (1971), 48=Frey (1975), 49=E.M. Hall (1991) (Tuningen), 50=E.M. Hall (1991) (Donaueschingen), 51=SBS (Ebersbach), 52=SSA (Überlingen), 53=SSA (Büßlingen), 54=SSA (Wangen), 55=VALTS (Niederwangen), 56=SNBW (Gerstetten), 57=SNWB (Sontheim an der Brenz), 58=SNBW (Rudersberg).

(=⟦ẹ⟧), which Besch describes as “half open” (‘halb offen’). Besch also includes nasalized monophthongs which I ignore because they do not occur in the context of dorsal fricatives. The dialect also has a number of phonemic diphthongs whose second component can be front (/ei ai/) or back (schwa), i.e. /iːə iə æːə æə uə/.

[x] and [ç] are the only two dorsal fricatives; those two sounds are only attested in postsonorant position but never word-initially.[3] As depicted in (1), [x] and [ç] stand in an allophonic relationship. I assume without argument that the underlying sound is velar (/x/) from which the palatal ([ç]) is synchronically derived. The arguments against a rule deriving [x] from an underlying palatal /ç/ – in Erdmannsweiler and in the velar fronting varieties of German dialects addressed below – cannot be evaluated until all German dialects have been discussed (§17.3.3).

(1) /x/

[x] [ç]

I consider first the distribution of [x] and [ç] from the synchronic perspective and then I examine the facts diachronically.[4]

The data presented below illustrate that [x] surfaces after a back vowel (in 2a) and [ç] (=⟦X⟧ for Besch) after a front vowel (in 2b) or a coronal sonorant consonant (in 2c). There are no dorsal fricatives after consonants other than [l] or [r], (e.g. [n]); hence, liquids are the only coronal sonorant consonants after which [ç] surfaces. Note that [r] fails to vocalize to [ɐ] as in other varieties (e.g. MoStGm in §1.2 and §17.2). The historical source for the dorsal fricatives in (2) and in the other UGm dialects discussed in this chapter is WGmc $^+$[k] or $^+$[x]; see Appendix F.[5]

[3] In contrast to many varieties of CGmc/LGm discussed in later chapters, velar [ɣ] and palatal [ʝ] are absent from UGm dialects like Erdmannsweiler; Appendix F provides some historical background accounting for those gaps. Alternations involving [g] and [ç] as in MoStGm (§1.2) are similarly absent in the varieties of German discussed below. Appendix H provides a consonant inventory for typical UGm dialects like Erdmannsweiler.

[4] One could argue that [h] is an allophone of /x/ as well, since [h] never contrasts with [x]/[ç]. ([h] surfaces only word-initially before a vowel). I do not discuss the treatment of [h] as an allophone of /x/ for Erdmannsweiler, although I return to this point in a related dialect (§3.3) which has alternations between [h] and [x]/[ç].

[5] In (2) and in all subsequent data sets, I present the transcription in the original source in the first column, my interpretation of that transcription with IPA symbols in the second column. In the third column I give the MoStGm orthography for reference, in the fourth column the English gloss, and in the final column the page number in the original source.

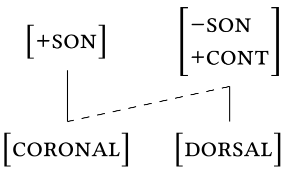
(2) Postsonorant [x] and [ç] (from /x/):

a.	sūxd	[suːxt]	Sucht	‘addiction’	30
	dsuxd	[tsuxt]	Zucht	‘breeding’	29
	hōx	[hoːx]	hoch	‘high’	38
	nǭxbər	[nɔːxbər]	Nachbar	‘neighbor’	32
	nāxd	[nɑːxt]	Nacht	‘night’	18
	laxə	[lɑxə]	lachen	‘laugh-INF’	18
	liəxd	[liəxt]	Licht	‘light’	45
	fīəxdə	[fiːəxtə]	fürchten	‘fear-INF’	31
	buəx	[buəx]	Buch	‘book’	47
	dsǫəxə	[tsɔəxə]	Zeichen	‘sign’	43
b.	filīXd	[filiːçt]	vielleicht	‘maybe’	36
	frēliX	[freːliç]	fröhlich	‘happy’	38
	nēXd	[neːçt]	gestern abend	‘yesterday evening’	21
	knǟXd	[knæːçt]	Knecht	‘vassal’	24
	häXlə	[hæçlə]	hecheln	‘heckle-INF’	21
	blaiX	[blɑiç]	bleich	‘pale’	43
	reiX	[reiç]	reich	‘rich’	37
c.	khalX	[kʰɑlç]	Kalk	‘lime’	18
	kherX	[kʰerç]	Kirche	‘church’	17

As noted in Chapter 1, the focus in this book is on the patterning of velars and palatals in native words, although I include occasional older borrowings which I consider to be assimilated loan words. For example, [kʰɑlç] ‘lime’ in (2c) was borrowed many centuries ago from Latin *calx*.

As indicated in the heading for (2), I analyze the underlying dorsal sound as /x/, which surfaces as palatal in (2b,c) by (3). The [ç] in (2b,c) therefore exemplifies the derived palatal category described in §2.4.3. I analyze front vowels and liquids (/l r/) as [+sonorant, coronal]. Given that analysis, underlying /x/ fronts to palatal [ç] after a front (i.e. coronal) vowel (in 2b) or after a front (i.e. coronal) sonorant consonant (in 2c) and otherwise (i.e. after a back vowel) surfaces without change as [x] (in 2a).

(3) Velar Fronting-1:



(3) spreads [coronal] from a [+sonorant] sound to a [dorsal] fricative, thereby creating the complex corono-dorsal segment [ç]. It is not necessary to specify that the target segment be marked for a laryngeal feature ([−fortis]) because there are no [+fortis] dorsal fricatives that could potentially undergo the rule. The target is specified as a dorsal fricative ([−sonorant, +continuant, dorsal]) and not as a dorsal obstruent ([−sonorant, dorsal]) or dorsal consonant ([+consonantal, dorsal]) because there is no indication in the original source that other velar sounds ([k g ŋ]) show a fronted variant after coronal sonorants. Unless specific evidence is provided to the contrary, I assume in all following case studies that velar fricatives (and not velar stops or the velar nasal) undergo fronting. In Chapter 11 I discuss varieties of German in which all velar consonants undergo fronting to the corresponding palatals.[6]

The data in (2) reveal a few gaps. For example, no words listed were found in the original source with a dorsal fricative preceded by the front vowel [e] or the back vowels [o ɔ ə]. Unless evidence can be adduced to the contrary, I assume that [e] patterns phonologically with the other front vowels and [o ɔ ə] with the other back vowels. Hence, the expectation is that [ç] would surface after [e] and [x] after [o ɔ ə].

The front vowel triggers for Velar Fronting-1 also include segments that alternate with back vowels. The most well-known front-back alternations are the ones referred to in the traditional literature as Umlaut. For example, in MoStGm, many singular nouns with a back stem vowel surface with the corresponding front vowel in the plural, e.g. *Stuhl* [ʃtuːl] 'chair' vs. *Stühle* [ʃtyːlə] 'chairs'. A representative example of such front vowel vs. back vowel alternations in Erdmannsweiler is presented in (4). Example (4b) illustrates that the front vowel [ei] triggers the change from /x/ as [ç].[7]

(4)	a.	roux	[roux]	Rauch	'smoke'	44
	b.	reiXə	[reiçə]	räuchern	'smoke-INF'	44

Although the literature on Umlaut in the synchronic grammar of MoStGm is vast and the proposals are quite diverse (e.g. Bach & King 1970, Janda 1987, Lieber

[6]The velar affricate [kx] is a sound that it attested in many (but not all) varieties of HAlmc and in a few of those varieties, [kx] has a palatal allophone [kç] (e.g. §3.4). The default assumption I adopt below (reflected in my description of Erdmannsweiler) is that [kx] is absent unless I explicitly state that it is present.

[7]From the historical perspective the fronted stem vowel in examples like the one in (4b) was an etymological back vowel, cf. OHG *rouh*. The fronting of back vowels was either a consequence of i-Umlaut (§2.4.3), which was triggered by a once overt front vowel suffix [i], or by analogy. The distinction between the two (sound change vs. analogy) is not important for present purposes and is therefore not discussed below.

1987, Wiese 1996a, Trommer 2021), it is nevertheless possible to identify two contrastive approaches. According to one, the stem vowel in alternating pairs is underlyingly back and the front vowel alternant is derived from that back vowel if Umlaut is analyzed as a synchronic rule. Underlying representations for the examples in (4) according to that approach are provided in (5a). The form of the synchronic rule of Umlaut presupposed in (5a) assumes that the underlying representation for the plural form is equipped with a floating frontness feature (see the literature cited above). According to the second approach, the stem alternants are lexically listed (suppletive) allomorphs, in which case Umlaut does not have the status of a synchronic rule. Underlying representations for the examples in (4) according to that approach are given in (5b). The latter treatment derives support from the fact that alternations like the ones in (4) – regardless of dialect – are irregular because they are triggered by certain morphological categories but not by others. Thus, according to (5b), Umlaut has been morphologized. The first approach (=5a) is defended by Wiese (1996a) and Trommer (2021) and the second (=5b) by Booij (2010).

(5) a. /roux/, /roux-ə/
    b. /roux/, /reix-ə/

Both treatments in (5) are consistent with the data from Erdmannsweiler, as well as similar data from other German dialects. In the present book I adopt (5b), although the analyses I discuss are also compatible with (5a).

In the dialect of Erdmannsweiler as it was described in 1961, /x/ is realized as [ç] not only after historically front vowels (=6a), but also after etymological back vowels that underwent the historical fronting, e.g. i-Umlaut or analogy (=6b). The surface velar [x] occurs after etymological back vowels (=6c) and after back vowels that were originally front (=6d). The reconstructed examples in the second column are my own. They are intended to represent the point before velar fronting was phonologized. The etymological information in (6) has been drawn from Seebold (2011), which is my source for etymologies in all subsequent datasets unless otherwise noted.

(6)	a.	[reiç]	<	+[riːx]	‘rich’	cf. MHG *rīch(e)*	(from 2b)
	b.	[reiçə]	<	+[rouxə]	‘smoke-INF’	cf. MHG *rouch*	(from 4b)
	c.	[hoːx]	<	+[hoːx]	‘high’	cf. MHG *hōch*	(from 2a)
	d.	[tsɔəxə]	<	+[tseixə]	‘sign’	cf. MHG *zeichen*	(from 2a)

The pan-Swb vocalic development depicted in (6d) involves the change from a front sound to a back sound; see Besch (1961: 42–43). It is a specific instance of a historical shift I call Vowel Retraction, which can be defined as any change from a front vowel to a back vowel, although the particular vowels that undergo it differ from dialect to dialect. Vowel Retraction therefore decreases the number of potential triggers for velar fronting (=Rule Z from Table 2.7); recall Dialect F from Figure 2.7. The general change is stated in (7a). The vocalic change depicted in (6b) is a specific example of what is referred to throughout this book as Vowel Fronting, which has the general form in (7b). Vowel Fronting increases the number of potential triggers for velar fronting (=Rule X from Table 2.7; recall Dialect E from Figure 2.7. The specific examples illustrating Vowel Retraction and Vowel Fronting discussed below could alter underlying representations, although some examples are still be active synchronically (e.g. the analysis of Umlaut in 5a as the modern reflex of the historical fronting in 6b).

(7) a. Vowel Retraction:
{ front vowel } > { back vowel }

b. Vowel Fronting:
{ back vowel } > { front vowel }

As I show in this book, dorsal fricatives behave differently in German dialects when they are in the context of a vowel that has undergone either Vowel Retraction or Vowel Fronting. In Erdmannsweiler and in many other dialects discussed below a dorsal fricative to the right of a new back vowel (=7a) surfaces transparently as velar, but in other dialects the dorsal fricative in the context of a new back vowel surfaces instead as an opaque palatal. A dorsal fricative adjacent to a new front vowel (=7b) in Erdmannsweiler is realized transparently as palatal, but in other German dialects that sound is an opaque velar.

Erdmannsweiler as it was described in 1961 was an outgrowth of an earlier stage in which /x/ was realized as [x], regardless of the nature of the preceding sound. I refer henceforth to that earlier point as Stage 1 (Figure 2.2) and postulate that the surface [x] showed the effects of coarticulatory velar fronting (to prevelar) at the level of Speech. Such non-fronting Stage 1 dialects are attested in the present day, e.g. in LAlmc, Halmc, and SBav (§3.3, §12.3.1, §12.3.2). The phonologization of Velar Fronting-1 (=Stage 2 from §2.5) is shown in (8) with three representative examples from (6). As a point of reference I give the MoStGm forms in the bottom row. As described in §2.5 the change from one stage to the next was intergenerational, involving the interaction between the speaker and the listener in acquisition.

(8)

a.

/riːx/	/hoːx/	/tseixə/
[riːx]	[hoːx]	[tseixə]
/reix/	/hoːx/	/tsɔəxə/
[reiç]	[hoːx]	[tsɔəxə]
reich	*hoch*	*Zeichen*
'rich'	'high'	'sign'

b.

/riːx/	/hoːx/	/tseixə/	Stage 1
[riːx]	[hoːx]	[tseixə]	
/reix/	/hoːx/	/tseixə/	Stage 2
[reiç]	[hoːx]	[tseiçə]	
/reix/	/hoːx/	/tsɔəxə/	Stage 2
[reiç]	[hoːx]	[tsɔəxə]	
reich	*hoch*	*Zeichen*	MoStGm
'rich'	'high'	'sign'	

Two possible chronologies involving Velar Fronting-1 and Vowel Retraction (/ei/ > /ɔə/ in *Zeichen*) are depicted in (8a) and (8b). According to (8a), Velar Fronting-1 was phonologized at the same time – or perhaps even after – Vowel Retraction restructured underlying representations. As depicted in (8b) it is also conceivable Velar Fronting-1 was active before Vowel Retraction. According to that scenario, there was a stage in which Velar Fronting-1 created palatal [ç] in words like *Zeichen* before the stem vowel was restructured to /ɔə/. In later chapters I demonstrate that the chronology in (8b) must have been correct for the other German dialects because those dialect-specific changes from front vowel to back vowel led to opacity via the phonemicization of the palatal allophone [ç] (/x/) to /ç/. However, one cannot know for certain whether or not the chronology in (8b) or (8a) is correct for Erdmannsweiler because Vowel Retraction led to transparent outputs according to either scenario. Note that in both (8a) and (8b) the historical process of Vowel Retraction bleeds Velar Fronting-1 in examples like [tsɔəxə].

The descriptive literature on many of the dialects spoken in Baden-Württemberg – both Swb and LAlmc – published from the late nineteenth century up to the present suggests that the transparent distribution of [x] and [ç] is precisely the same as it is in Erdmannsweiler. For example, one can observe that [ç] only surfaces after a coronal sonorant and [x] only after a back vowel in the varieties spoken in Horb am Neckar (Kauffmann 1887), Forbach (Heilig 1897), Pforzheim (Sexauer 1927), Freudenstadt (Baur 1967), Stuttgart (Frey 1975), and the broad area around Villingen-Schwenningen (E.M. Hall (1991: 55–56). All of those places – as well as a number of other ones in the same area – are indicated on Figure 3.1.

However, the default pattern exemplified in the communities listed in the previous paragraph stands in contrast with the Swb and LAlmc varieties discussed in §14.3.2. In that section I demonstrate that a number of German dialects in Baden-Württemberg have been described in which [ç] occurs not only after coronal sonorants, but also after one or more back vowel, e.g. Blaubeuren (Strohmaier 1930), Mühlingen (Müller 1911), and Liggersdorf (Dreher 1919). There are also a few isolated pockets within the LAlmc/Swb dialect region in which only a subset of coronal sonorants triggers velar fronting (§12.3). The lesson to be learned from these surprising revelations is that one cannot assume a priori that the default pattern for any given dialect region is correct until one has examined the entire range of facts.

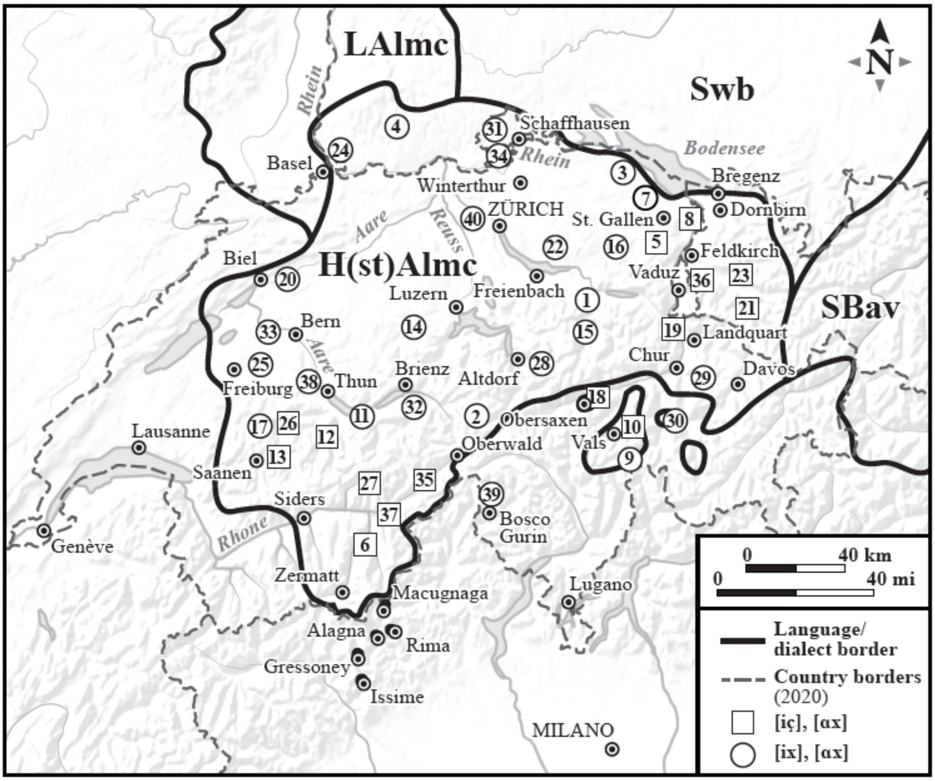
3.3 High Alemannic (part 1)

SwGm is typically characterized by the presence of a dorsal fricative surfacing invariantly as back even in a front vowel context; hence, in the unmarked case, speakers of SwGm have [x] but no [ç]. Descriptions of H(st)Almc dialects of Switzerland with [x] *sans* [ç] therefore represent the norm for that region. For example, in Keller's (1961) description of Bern German (Figure 3.2) he writes (p. 51): "[x] is a velar fricative articulated rather far back. The place of articulation is not influenced by the surrounding sounds". An early twentieth century description of the HAlmc dialect spoken in the canton of Glarus (Figure 3.2) is essentially the same (Streiff 1915). Streiff (1915: 12) writes that [x] is articulated on the soft palate ('am weichen Gaumen') and that the dialects she describes do not have a palatal articulation of that sound. ("Einen palatalen x-Laut kennen unsere Mundarten nicht …"), e.g. [tseːxə] 'toe'. Additional varieties of H(st)Almc with velars (/x/) without palatal allophones are indicated on Figure 3.2.

A few H(st)Almc dialects have been described which possess both velar and palatal fricatives, and a subset of those dialects displays a parallel distribution of velar and palatal affricates. In the present section and in the following one I discuss two varieties in which velars and palatals stand in an allophonic relationship. The distribution of the velar and palatal sounds discussed below can be contrasted with the very different patterning one finds in the two HstAlmc dialects discussed in Chapter 6, which possess neutral vowels.

Meinherz (1920) offers a detailed account of the HAlmc dialect spoken in the northernmost part (Region Landquart) of the canton of Grisons (Graubünden) in East Switzerland. The region is known historically as the Bündner Herrschaft; see also §15.11 and Figure 15.9.

Meinherz (1920: 20) draws a distinction between the dialect he calls H_1 which is spoken in the municipalities (Gemeinden) of Maienfeld, Fläsch and Malans and the dialect referred to as J, which is spoken only in Jenins. I concentrate below on H_1 because this variety has velar fronting. The dialect is referred to henceforth as Maienfeld.



Map 3.2: High Alemannic (HAlmc) and Highest Alemannic (HstAlmc). White squares indicate postsonorant velar fronting and circles no velar fronting. 1=Winteler (1876), 2=Abegg (1910), 3=Enderlin (1910), 4=Kaiser (1910), 5=Vetsch (1910), 6=Wipf (1910), 7=Hausknecht (1911), 8=Berger (1913), 9=Gröger (1914c), 10=Gröger (1914e), 11=Gröger (1914b), 12=Gröger (1914a), 13=Gröger (1914d), 14=Schmid (1915), 15=Streiff (1915), 16=Wiget (1916), 17=Stucki (1917), 18=Brun (1918), 19=Meinherz (1920), 20=Baumgartner (1922), 21=Jutz (1922), 22=Weber (1923), 23=Jutz (1925), 24=Beck (1926), 25=Henzen (1927) (Sensebezirk), 26=Henzen (1927) (Obersimmental), 27=Henzen (1928/1929), Henzen (1932), 28=Clauss (1929), 29=Kessler (1931), 30=Hotzenköcherle (1934), 31=Wanner (1941), 32=Schultz (1951), 33=Keller (1961), 34=Keller (1963), 35=Schmid (1969), 36=Bethge & Bonnin (1969), 37=Werlen (1977), 38=Marti (1985), 39=Russ (2002), 40=Fleischer & Schmid (2006).

The phonemic monophthongs of Maienfeld (Meinherz 1920: 22) consist of the front vowels /iː i ɪː ɪ eː e ɛː ɛ/ and the back vowels /uː u ʊː ʊ oː o ɔː ɔ ɑː ɑ ə/. As in many other varieties of SwGm, length and tenseness can be combined in the mid and high vowels to yield a system with a large number of monophthongs. Meinherz also includes a several nasalized monophthongs which I ignore because they do not occur in the data I investigate below with dorsal fricatives. Meinherz (1920: 22) lists fifteen diphthongs, but the material I consider below only contains /æi/ and /uə/.

Maienfeld differs from the variety spoken in the municipality of Jenins (see above) in terms of the realization of /x/; see Meinherz (1920: 26). Jenins exhibits the default (Stage 1) pattern for SwGm in the sense that that dorsal fricative is consistently realized as [x], regardless of what segment precedes or follows. By contrast, Maienfeld has a palatal realization of /x/, which occurs only after a coronal sonorant (see below). The allophonic relationship between [x] and [ç] is depicted in (1). The two surface fricatives [x] and [ç] are only attested in postsonorant position but never word-initially. Words in the Jenins dialect with word-initial [x] (<WGmc $^+$[k]) are realized in Maienfeld as [k^h], e.g. *Käfer* [k^{h}ɛːfər] 'bug' vs. Jenins [xɛfər]; Meinherz (1920: 134).

Although the vowels of Maienfeld differ from those of Erdmannsweiler the generalization concerning the distribution of [x] and [ç] is the same in both dialects: [x] surfaces after a back vowel (in 9a) and [ç] after a front vowel (in 9b) or a coronal sonorant consonant (in 9c); see Meinherz (1920: 135). Meinherz (1920: 27) is clear that [r] is a coronal (apical) trill and not a uvular (i.e. dorsal) sound ("r ist stark gerolltes Zungen-r"). The two dorsal fricatives [x]/[ç] as in (9) derive from etymological velars (WGmc $^+$[k x]).

There are no dorsal fricatives after consonants other than [l] or [r], (e.g. [n]); hence, liquids are the only coronal sonorant consonants after which [ç] surfaces. No examples were found in the original source with a dorsal fricative preceded by the front vowels [œ œː] or the back vowel [ɑː]. I treat these gaps as accidental.

(9) Postsonorant [x] and [ç] (from /x/):

a.	brūx	[bruːx]	Brauch	'custom'	135
	brux	[brux]	Bruch	'fracture'	135
	hōx	[hoːx]	hoch	'high'	144
	šprɔx	[ʃprɔːx]	Sprache	'language'	135
	lɔx	[lɔx]	Loch	'hole'	135
	bɑx	[bɑx]	Bach	'stream'	135
	buəx	[buəx]	Buch	'book'	135

b.	rīχ	[riːç]	reich	‘rich’	135
	štiχ	[ʃtiç]	Stich	‘sting’	135
	šǖχ	[ʃyːç]	scheu	‘timid’	144
	tsyχt	[tsyçt]	zieht	‘moves-3SG’	143
	tsεχ	[tsεːç]	zäh	‘tough’	144
	frεχ	[frεç]	frech	‘impudent’	135
	hȫχs	[høːçs]	hohes	‘high-INFL’	143
	wæiχ	[wæiç]	weich	‘soft’	135
c.	milχ	[milç]	Milch	‘milk’	137
	khɑlχ	[kʰɑlç]	Kalk	‘lime’	137
	wεrχ	[wεrç]	Werk	‘work’	137
	štɔrχ	[ʃtɔrç]	Storch	‘stork’	137

The complementary distribution of [x] and [ç] is captured by positing an underlying /x/ which surfaces as [ç] after a coronal sonorant by Velar Fronting-1 (recall 3). As in Erdmannsweiler (recall 4), the front vowel triggers for that process in Maienfeld also include alternating examples involving Umlaut like [høːçs] ‘high-INFL’ (cf. [hoːx] ‘high’).[8]

One difference between Erdmannsweiler and Maienfeld is that /x/ in all of the examples presented in (9) is in coda position; cf. (2) and (4) with several words in which [ç]/[x] are situated between vowels and are hence in the onset. There is no reason to specify that Velar Fronting-1 for Maienfeld only affects a coda sound because there is no /x/ in a word-initial onset or a word-internal onset (e.g. intervocalic position) which could potentially undergo the rule. As noted above, dorsal fricatives do not occur in word-initial onsets. The reason there are no word-internal onsets with a dorsal fricative is indicated in (10). Meinherz (1920: 26) shows that Maienfeld has debuccalized WGmc ⁺[x] to [h] in the context between vowels (in the first example 10a and 10b) or between a liquid and vowel (in the first example in 10c). I interpret those two contexts as onset position; in (10) and elsewhere the dot in the phonetic transcriptions indicates the syllable boundary. By contrast, WGmc ⁺[x] is retained as a fricative ([x] or [ç]) in coda position, as in the second and third example in (10a) and (10b) and in the second example in (10c). The consequence of the debuccalization of WGmc ⁺[x] to [h] in intervocalic position is that there are now synchronic alternations between [h] and [x]/[ç].

[8] Meinherz (1920) is one of the rare examples of a descriptive grammar which states explicitly that velar stops do not undergo fronting. Meinherz (1920: 25) writes: “Zwischen *g* in *gi, ig* und *ga, ag* sowie zwischen *k* in *ki, ik* und *ka, ak* konnte ich keinen merklichen unterschied hören”. [‘I could not hear a noticeable difference between *g* in *gi, ig* and *ga, ag* as well as between *k* in *ki, ik* and *ka, ak*’.]

(10) [x]~[ç]~[h] alternations:

a.	mɑhə	[mɑ.hə]	mache	‘do-1sg’	136
	mɑxšt	[mɑxʃt]	machst	‘do-2sg’	136
	mɑxt	[mɑxt]	macht	‘does-3sg’	136
b.	štrīhə	[ʃtriː.hə]	streiche	‘paint-1sg’	136
	štrīχšt	[ʃtriːçʃt]	streichst	‘paint-2sg’	136
	štrīχt	[ʃtriːçt]	streicht	‘paints-3sg’	136
c.	štɔrhə	[ʃtɔr.hə]	Haus zum Storchen	‘(name)’	137
	štɔrχ	[ʃtɔrç]	Storch	‘stork’	137

From the synchronic perspective, /x/ is the underlier and the historical process of Debuccalization (Debucc) remains active as a synchronic rule:

(11)

	/ʃtriːx-t/	/ʃtriːx-ə/
Debucc	------	ʃtriː.hə
Vel Fr-1	ʃtriːçt	------
	[ʃtriːçt]	[ʃtriː.hə]
	‘paints-3sg’	‘paint-1sg’

In (11) Debuccalization (/x/⟶[h] / $_{\sigma}$[__V) bleeds Velar Fronting-1 (Vel Fr-1) in example [ʃtriː.hə]. Note that the treatment in (11) is consistent with treating [h] as an allophone of /x/ (Map 4).[9] The bleeding relationship in (11) is a specific instantiation of Dialect C from Figure 2.6.

Maienfeld displays the default pattern described earlier for Erdmannsweiler: /x/ undergoes fronting after any coronal sonorant. From the diachronic perspective, any front segment serves as a trigger for Velar Fronting-1, regardless of historical source. In contrast to Erdmannsweiler, there were apparently no instances of Vowel Retraction in Maienfeld (recall the change from /ei/ to /ɔə/ in 6d), although many examples illustrate Vowel Fronting (=i-Umlaut), e.g. the [øː] in [høːçs] ‘high-infl’ which is etymologically [oː]; cf. OHG *hōh*. Thus, the front segments that trigger Velar Fronting-1 were either historically front or they were historically back and underwent Vowel Fronting (=i-Umlaut).

[9] The reader is referred to Hall’s (2009b, 2010, 2011a) treatment of [h]~[x] alternations akin to the ones in (10) in the related SBav dialect spoken in Imst (Schatz 1897; Figure 3.3). Imst differs from Maienfeld because [h] and [x] contrast in word-medial position and alternations like the ones in (10) must be accounted for with a rule converting /h/ to [x] in coda position (Buccalization). In the analysis for Imst described here, rule inversion has occurred (Vennemann 1972, Hall 2009b and §8.6.2) because Debuccalization has been reanalyzed as a rule of Buccalization with /h/ as the target.

3.4 High Alemannic (part 2)

Berger (1913) describes a variety of HAlmc spoken in Rheintal in Northeast Switzerland in the canton of St. Gallen (Figure 3.2). Rheintal is a large area indicated in greater detail on Figure 15.9, which depicts velar fronting areas in East Switzerland, Liechtenstein, and Vorarlberg. It is clear from Berger (1913) that velar fronting is active in Rheintal, but it is also evident that the facts involving velars and palatals in Rheintal differ in various ways from the distribution of [x] and [ç] in Maienfeld.

In addition to [x] and [ç], Rheintal also possesses the corresponding affricates, i.e. velar [kx] and palatal [kç]. Velars ([x], [kx]) and the corresponding palatals ([ç], [kç]) stand in an allophonic relationship: In word-initial position, the two dorsal affricates are positional variants (see 12a). In postsonorant position (see 12b) two dorsal fricatives and the two dorsal affricates are likewise allophones. The dorsal fricatives in (12b) are shown below to have prosodically-determined fortis geminate counterparts ([xx] and [çç]), which exhibit the same distribution as the corresponding lenis sounds.

(12) a. /kx/ → [kx] [kç]
b. /x/ → [x] [ç]
/kx/ → [kx] [kç]

The phonemic monophthongs of Rheintal consist of the front vowels /iː i yː y ɪː ɪ eː e øː ø ɛː ɛ œː œ/ and the back vowels /uː u oː o ɔː ɔ ɑː ɑ ə/. Diphthongs occurring adjacent to a dorsal fricative are /iːə yːə eə ɛːə ɛə œːə uə ɔːə/. Note that all of those diphthongs end in schwa.

The patterning of the fricatives and affricates in (12) requires that the mid front lax series of vowels (/ɛː ɛ œː œ/) be analyzed as phonologically [+low], as in Table 3.1; I make the noncrucial assumption that the corresponding back vowels (/ɔː ɔ/) are likewise [+low]. [+low] front vowels include the monophthongs /ɛː ɛ œː œ/ as well as the /ɛː ɛ œː œ/ component of diphthongs. The analysis of vowels in Table 3.1 is analogous to the treatment of /i e ɛ/ described in (7b) of §2.2.3.

It can be seen that front vowels are [coronal], and back vowels are [dorsal]. All rounded vowels are [labial], while unrounded vowels are unmarked for that feature. For front unrounded vowels, front rounded vowels, as well as back vowels, either [+low] or [−low] is assigned. Among all vowels bearing specification for [−low], [+high] is assigned to the high vowels, while mid vowels receive [−high].

Table 3.1: Distinctive features for vowels (Rheintal)

	iː i	ɪː ɪ	eː e	ɛː ɛ	yː y	øː ø	œː œ	uː u	oː o	ɔː ɔ	ɑː ɑ
[coronal]	✓	✓	✓	✓	✓	✓	✓				
[dorsal]								✓	✓	✓	✓
[labial]					✓	✓	✓	✓	✓	✓	
[low]	−	−	−	+	−	−	+	−	−	+	
[high]	+	+	−		+	−		+	−		
[tense]	+	−									

The feature [±tense] distinguishes /iː i/ from /ɪː ɪ/. I omit schwa from Table 3.1, which is placeless.[10]

Data illustrating the complementary distribution of [kx] and [kç] in word-initial position (=12a) are presented in (13). The examples show that the velar occurs before a back vowel (in 13a) or a [+low] front vowel (in 13b). The palatal surfaces before a [−low] front vowel (in 13c), or a coronal sonorant consonant ([r l n], in (13d). Berger (1913: 11) describes the rhotic [r] as a tongue-tip trill ('Zungenspitzen-r'). There are no restrictions concerning the type of vowel that can follow the sonorant consonant in (13d).[11] The historical source for the word-initial affricates was WGmc ⁺[k], which is preserved as [k] in other dialects, cf. the MoStGm orthography in the third column.

(13) Word-initial [kx] and [kç] (from /kx/):

a.	kxūšt	[kxuːʃt]	Kunst	'art'	134
	kxuttɩg	[kxuttɪg]	wählerisch	'choosy'	44
	kxopf	[kxopf]	Kopf	'head'	42
	kxɔ	[kxɔː]	kommen	'come-INF'	134
	kxɔrn	[kxɔrn]	Korn	'grain'	42
	kxɑts	[kxɑts]	Katze	'cat'	134

[10] Berger (1913: 7) also lists among the monophthongs the phonetically low front vowels [æ] (=⟦æ⟧) and [æː] (=⟦ǣ⟧), but it is clear from the discussion in that source that [æ] and [æː] occur in some communities in place of the two vowels [ɛ] and [ɛː].

[11] Dorsal fricatives do not occur in word-initial position in the communities whose phonology is described below, although other places in the same region have dorsal fricatives instead of affricates in (13). Among speakers with word-initial dorsal fricatives, their distribution mirrors that of [kx] and [kç].

b.	kxεəfər	[kxεəfər]	Käfer	‘bug’	33
	kxεər	[kxεːər]	Keller	‘cellar’	34
	kxεənnə	[kxεːənnə]	Kern	‘core’	34
c.	kχittɪl	[kçittɪl]	Kittel	‘smock’	134
	kχündə	[kçyndə]	künden	‘proclaim-INF’	46
	kχȫərə	[kçøːərə]	gehören	‘belong_to-INF’	17
	kχeərχχə	[kçeərççə]	Kirche	‘church’	136
d.	kχlεəbə	[kçlεəbə]	kleben	‘stick-INF’	134
	kχrott	[kçrott]	Kröte	‘toad’	134
	kχnoblə	[kçnoblə]	Knoblauch	‘garlic’	136

Additional evidence that only [−low] front vowels are preceded by the palatal affricate can be observed in (14). The word-initial affricate in the first item in (14a) is predictably velar because the following vowel is back. When that vowel shows the effects of Umlaut in the second word in (14a) the affricate remains velar because the front vowel ([œ]) is [+low]. That nonalternating [kx] can be contrasted with the [kx] that alternates with [kç] before a front [−low] vowel, as in (14b).

(14)	a.	kxɔrəb	[kxɔrəb]	Korb	‘basket’	108
		kxɔrbə	[kxœrbə]	Körbe	‘baskets’	75
	b.	kxugələ	[kxugələ]	Kugel	‘ball’	44
		kχügəli	[kçygəli]	kleine Kugel	‘ball-DIM’	65

I account for the distribution of word-initial velar and palatal affricates by positing that the underlying sound in (13) and (14) is velar /kx/, which surfaces as palatal by either (15a) or (15b). In the elsewhere case, /kx/ is realized without change as [kx]. (15a) converts a velar to the corresponding palatal in word-initial position before a [−low] front vowel, while (15b) creates a palatal before a coronal sonorant consonant. The two operations cannot be collapsed into a single one because [±low] is not a distinctive feature for consonants. The target of both (15a) and (15b) is a dorsal [−sonorant, +continuant] sound, which is either /kx/ or /x/; recall the representations in (2) of §2.2.2. This is the correct prediction because the fricatives [x] and [ç] for many speakers have a distribution that parallels the patterning of the corresponding affricates (see Map 11).

(15)

a. Wd-Initial Velar Fronting-1:

$$\begin{array}{lcc} {}_{\text{wd}}[& \begin{bmatrix} -\textsc{son} \\ +\textsc{cont} \end{bmatrix} & [-\textsc{low}] \\ & | & | \\ & [\textsc{dorsal}] & [\textsc{coronal}] \end{array}$$

b. Wd-Initial Velar Fronting-2:

$$\begin{array}{lcc} {}_{\text{wd}}[& \begin{bmatrix} -\textsc{son} \\ +\textsc{cont} \end{bmatrix} & \begin{bmatrix} +\textsc{cons} \\ +\textsc{son} \end{bmatrix} \\ & | & | \\ & [\textsc{dorsal}] & [\textsc{coronal}] \end{array}$$

According to both (15a) and (15b) the feature [coronal] spreads leftward onto a [−sonorant, +continuant, dorsal] segment (i.e. /kx/ or /x/). Dorsal stops (/g k/) cannot undergo the change because all stops are [−sonorant, −continuant].

Velar and palatal fricatives stand in an allophonic relationship in postsonorant position (=12b), as illustrated in (16): Velars surface after a back vowel (in 16a) or a [+low] front vowel (in 16b) and palatals after a front [−low] vowel (in 16c) or liquid (in 16d).[12] No examples were found in the original source with a dorsal fricative after [l] – a gap I consider to be accidental. Due to an added complication, I delay discussion of velars and palatals after diphthongs to the end of this section. The diachronic source for the dorsal fricatives in (16) is WGmc $^{+}$[x k].

(16) Postvocalic dorsal fricatives (from /x/):

a.	šlūx	[ʃlu:x]	Schlauch	'hose'	13
	bruxx	[bruxx]	Bruch	'fracture'	135
	rōx	[ro:x]	Rauch	'smoke'	13
	dox	[dox]	doch	'however'	140
	šprɔx	[ʃprɔ:x]	Sprache	'language'	135
	lɔxx	[lɔxx]	Loch	'hole'	135
	tɑxx	[tɑxx]	Dach	'roof'	135
	feəlɘxt	[feəlɘxt]	vielleicht	'maybe'	38
b.	nɛx	[nɛ:x]	nahe	'near'	140
	nɛxt	[nɛxt]	gestern abend	'last evening'	140
c.	rīχχ	[ri:çç]	reich	'rich'	135
	štiχχ	[ʃtiçç]	Stich	'sting'	38
	šǖχ	[ʃy:ç]	scheu	'timid'	140
	flüχšt	[flyçʃt]	fliehst	'flee-2sg'	58
	löχχli	[løççli]	Löchlein	'hole-dim'	43
d.	mɑrχχ	[mɑ:rçç]	(Grenz)mark	'borderlands'	136
	kχeərχχə	[kçeərççə]	Kirche	'church'	136

[12] Dorsal fricatives surface either as lenis ([x]/[ç]) or fortis ([xx]/[çç]) depending on the length of the preceding vowel. In the analysis I present below I ignore the fortis vs. lenis distinction.

The generalizations concerning the distribution of velars and palatals after vowels are clear from the original source (Berger 1913: 113).

Examples like [lɔxx] 'hole' vs. [løççli] 'hole-DIM' in (16) display velar vs. palatal alternations triggered by Umlaut-induced stem alternations (cf. 14b). Velar vs. palatal pairs like [lɔxx] vs. [løççli] can be contrasted with the nonalternating velar [x] in (17). Note that the dorsal fricative in the first example in both word pairs is velar because it follows a back vowel. The /x/ following the front alternant surfaces without change as [x] because the front vowel is [+low] (cf. 14a).[13]. Significantly, the pronunciation with [e] requires the dorsal fricative to surface as palatal, i.e. [neçt] (=⟦neχt⟧). The palatal realization of /x/ confirms the analysis of /e/ as a front [−low] vowel (recall Table 3.1).

(17)	a.	šprɔ̄x	[ʃprɔːxə]	Sprache	'language'	49
		šprɔ̄xli	[ʃprœːxli]	reden	'talk-INF'	49
	b.	nɑxt	[nɑxt]	Nacht	'night'	125
		nɛxt	[nɛxt]	Nächte	'nights'	31

The distribution of postvocalic dorsal affricates mirrors the distribution of the equivalent fricatives (=12b). Thus, the velar surfaces after a back vowel (in 18a) or a front [+low] vowel (in 18b) and the palatal after a [−low] front vowel (in 18c) or liquid (in 18d). No examples were found in the original source with a dorsal affricate after [r]. This gap is accidental.[14]

(18) Postvocalic [kx] and [kç] (from /kx/):

a.	trukxə	[trukxə]	drücken	'press-INF'	137
	rokx	[rokx]	Rock	'skirt'	137
	sɑkx	[sɑkx]	Sack	'sack'	137
b.	ɛkxər	[ɛkxə]	Äcker	'fields'	31
c.	štrikχ	[ʃtrikç]	Strick	'cord'	137
	glükχ	[glykç]	Glück	'fortune'	46
	trükχnə	[trykçnə]	trocknen	'dry-INF'	137
	rökχli	[røkçli]	Röcklein	'skirt-DIM'	43
	brökχə	[brøkçə]	Brocken	'chunk'	62
	štrekχə	[ʃtrekçə]	strecken	'stretch-INF'	137

[13]Berger notes that the front counterpart of [ɑ] in Umlaut alternations like the one in (17b) can be [e] for some words. He documents some doublets, i.e. words whose fronted vowel is [ɛ] or [e]. One such example is the morpheme *Nacht* in (17b)

[14]Dorsal affricates also occur after a nasal, but it is not clear from the original source whether or not the nasal in question is velar ([ŋ]) or palatal ([ɲ]). For this reason I refrain from discussing these examples. See Berger (1913: 137) for discussion.

d.	marχχ	[maːrçç]	(Grenz)mark	'borderlands'	136
	kχeərχχə	[kçeərççə]	Kirche	'church'	136
	wolkχə	[wolkçə]	Wolke	'cloud'	136
	milkχ	[milkç]	Milch	'milk'	137

As in word-initial position, Rheintal requires two distinct rules to capture the distribution of dorsal fricatives and affricates in postsonorant position: One applies after a [−low] front vowel (=19a) and the other after a coronal sonorant consonant (=19b). In the elsewhere case (after [+low] front vowels or back vowels) /x/ and /kx/ surface without change.

(19) a. Velar Fronting-2: b. Velar Fronting-3:

As in (15), Velar Fronting-2 and Velar Fronting-3 cannot be collapsed into the same rule because [−low] is distinctive for vowels but not for consonants.

The data presented above illustrate that palatal fricatives and affricates surface in the neighborhood of nonlow front vowels that were originally front as well as nonlow front vowels that were originally back, e.g. the [ø] in [løççli] 'hole-DIM' from (16c), which was originally [o] (in OHG). Thus, i-Umlaut (as an instance of Vowel Fronting) fed Velar Fronting-2.

The final set of examples (in 20) show the distribution of dorsal fricatives after diphthongs. The generalization is that the palatal fricative occurs after a schwa-final diphthong only if the first part of that diphthong is a [−low] front vowel, as in (20c). If the first member of a schwa-final diphthong is back (in 20a), or [+low] and front (in 20b), then the dorsal fricative surfaces as velar. There do not appear to be examples in the original source in which a dorsal affricate follows a diphthong whose first member is [−low] and front, but the expectation is that the dorsal affricates would behave like the dorsal fricatives.

(20) Dorsal fricatives (from /x/) after diphthongs:

a.	buəx	[buəx]	Buch	'book'	135
	fluəxxə	[fluəxxə]	fluchen	'curse-INF'	135
	glɔəx	[glɔːəx]	Gelenk	'joint'	54
b.	štrɔ̃əx	[ʃtrœːəx]	Streich	'prank'	55
	frɛəxx	[frɛəxx]	frech	'impudent'	135

c.	līəχt	[liːəçt]	Licht	'light'	140
	fǖəχt	[fyːəçt]	feucht	'damp'	75
	seəχχə	[seəççə]	Sichel	'sickle'	135

The generalizations described above are also visible in word pairs with Umlaut-induced stem vowel alternations, e.g. [psuːəx] 'visit' (=⟦psūəx⟧) with [x] after a schwa-final diphthong preceded by a back vowel vs. [psyːəçç] 'visits' (=⟦psǖəχχ⟧) with [çç] after a schwa-final diphthong preceded by a [−low] front vowel.

I argue that the vowel transcribed in (20) as schwa ([ə]) is phonologically front ([coronal]) in the context after a front vowel but that it remains placeless (recall §2.2.3) in the elsewhere case, e.g. after a back vowel. The change from /ə/ to a coronal vowel is accomplished with (21). A slightly different version of the same process is posited below for a different set of dialects (§5.4). Schwa Fronting-1 is also discussed in §13.5.2 and a similar epenthetic process (Schwa Fronting-2) in §5.4 and §15.3. For general discussion see §12.8.1.[15]

(21) Schwa Fronting-1:

$$\begin{array}{ll} [-\text{CONS}] & \begin{bmatrix} -\text{CONS} \\ +\text{SON} \end{bmatrix} \\ \quad | & \\ [\text{CORONAL}] & \end{array}$$

Schwa Fronting-1 makes sense from the point of view of phonetics because schwa is usually seen as a targetless vowel whose production does not involve an active articulatory gesture (e.g. Barry 1995 for German schwa). For that reason, schwa is therefore highly susceptible to coarticulatory influences from neighboring segments, as expressed in (21).

(21) is a specific instantiation of Vowel Fronting (=7b). The data in (20) require that Schwa Fronting-1 feeds Velar Fronting-2, which is precisely what one would expect in a dialect like Rheintal with a transparent distribution of velars and palatals. For example, in the word [liːəçt] 'light' (/liːəxt/ from 20c), the feature [coronal] spreads from /iː/ to schwa, at which point the derived front vowel spreads the inherited [coronal] feature to /x/, thereby creating the palatal fricative [ç]. For transparency I transcribe the fronted realization of schwa with a diacritic:

[15] As stated in (21), Schwa Fronting-1 spreads [coronal] from any front vowel, including [+low] front vowels in words like [frɛəxx] 'impudent' from (20b). The reason the dorsal fricative surfaces as velar in that type of word is that /ɛ/ is [−low]. Alternatively, one could restrict the set of triggers of Schwa Fronting-1 to nonlow front vowels. Since it cannot be determined which of the two options is correct I simply leave this question open.

/liːəxt/⟶|liːə̟xt|⟶[liːə̟çt]. (Here and below I enclose sounds at an intermediate synchronic stage in vertical lines, e.g. |x|). The feeding relationship described here is a specific instantiation of Dialect B from Figure 2.5.

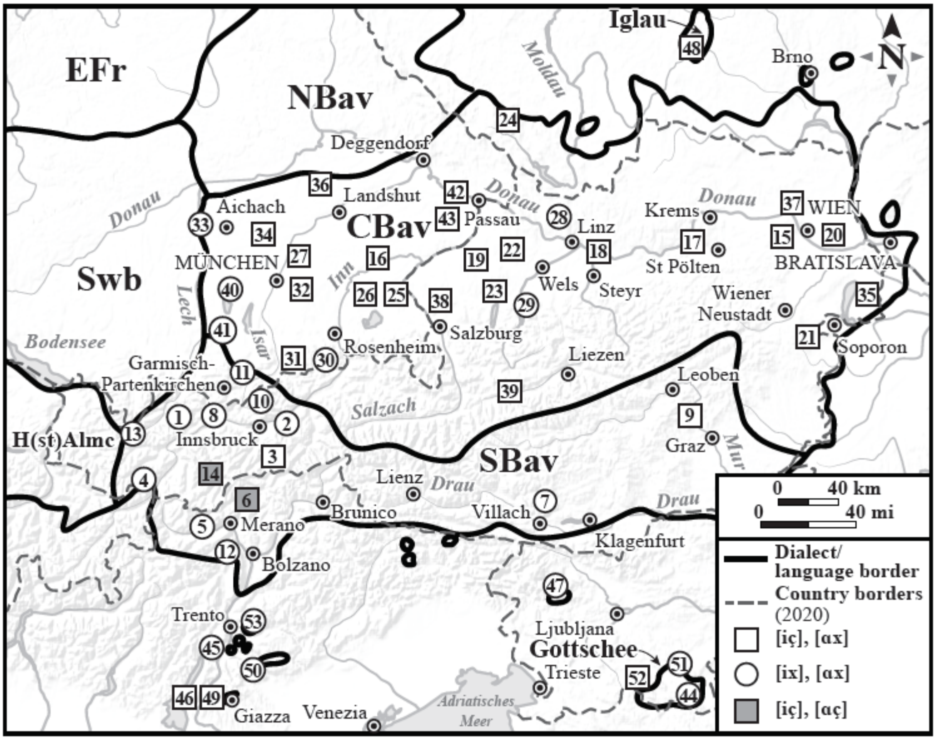
3.5 Central Bavarian (part 1)

The occurrence of [x] and [ç] as positional variants (allophones) after any coronal sonorant is a feature of CBav (as well as the related UGm dialects NBav and EFr). By contrast, SBav often preserves [x] even in the context of front vowels. An example of a non-velar fronting (Stage 1) SBav place is Imst (Schatz 1897; Figure 3.3). According to Schatz's phonetic description (p. 9), the ach-Laut is articulated on the back part of the soft palate ('am hinteren weichen Gaumen'), regardless of what kind of sound precedes, e.g. [tsøx] 'tick'. Hathaway (1979: 85) investigated the same dialect over seventy years later and did not detect a change.

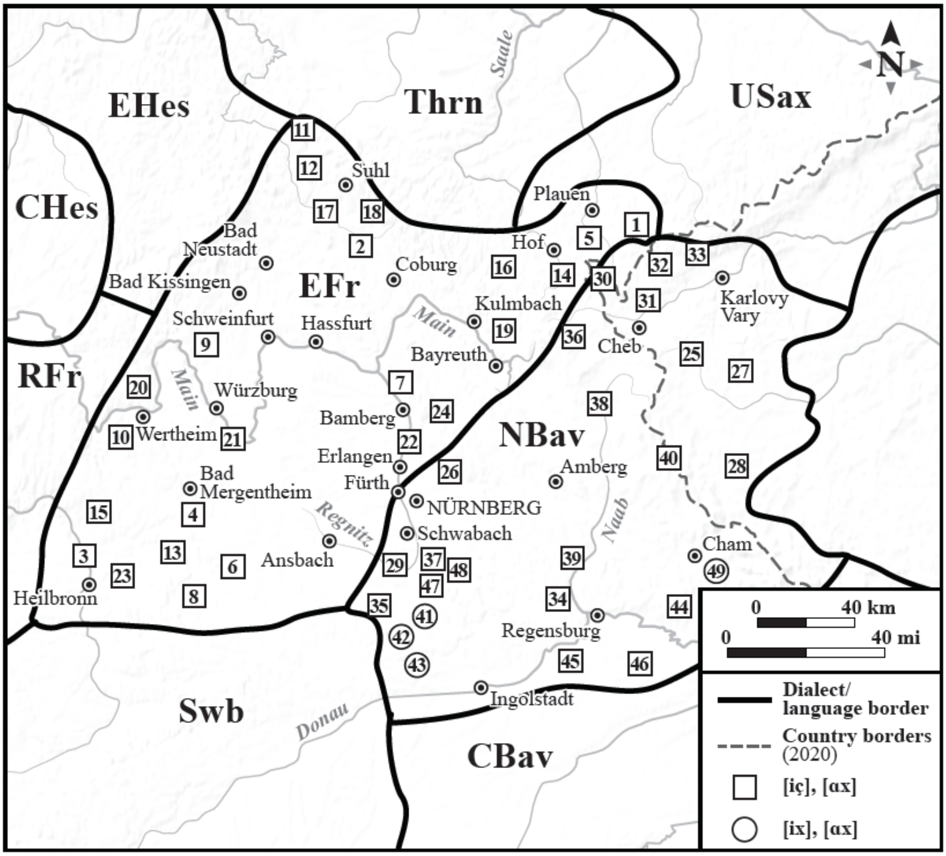
Noelliste (2017) describes the realization of dorsal fricatives for speakers in the Austrian town of Ramsau am Dachstein in the state of Styria (Steiermark; Figure 3.3). The dialect is discussed below as a representative example of a velar fronting variety of CBav. Figure 3.4 (NBav and EFr) is given here for reference, even though the varieties depicted on the that map are not discussed until latter chapters.

The phonemic monophthongs of Ramsau am Dachstein consist of the front vowels /i ɪ e ɛ/ and the back vowels /u ʊ o ɔ ɑː ɑ ə/. The phonemic diphthongs are /ɑi ɔi ɑu/, although I do not discuss /ɔi/ because of its rarity. The dialect also has diphthongs that Noelliste considers to be synchronically derived from monophthongs, e.g. [eə] (from /e/). The only dorsal fricatives are [x] and [ç], which stand in an allophonic relationship in postsonorant position as in (1). Neither sound occurs word-initially.

The following data illustrate that [x] (<WGmc ⁺[x k]) surfaces after back vowels (=22a) and [ç] after front vowels (=22b). As noted above, Noelliste (2017) demonstrates that there is an optional rule (Diphthongization) converting tense monophthongs (front or back) to diphthongs ending in a back vowel, e.g. /e/ can be realized as [e] or [eə] and /o/ as [o] or [oʊ]. Example (22c) is important because it shows that [ç] surfaces as expected after [e] but that [x] occurs after the derived diphthong [eə]. The realization of the dorsal fricative as [x] after [eə] is expected because the second component of the diphthong ([ə]) is back (cf. the example [nəx] 'after' from 22a). Examples like [seəxi] indicate that Schwa Fronting-1 (=21) is not active. No examples are present in Noelliste's corpus for dorsal fricatives after [ɔ ɛ], which she considers to be accidental gaps.



Map 3.3: South Bavarian (SBav) and Central Bavarian (CBav). White squares indicate assimilatory postsonorant velar fronting, shaded squares nonassimilatory postsonorant velar fronting and circles no postsonorant velar fronting. 44–53 are German-language islands. 1=Schatz (1897), 2=Schatz (1903), 3=Egger (1909), 4=Gröger (1924), 5=Insam (1936) (Naturns), 6=Insam (1936) (Passeier), 7=Kurath (1965), 8=Hathaway (1979), 9=Moosmüller (1991), 10=Moosmüller (1991), 11=Stein-Meintker (2000), 12=Kollmann (2007), 13=VALTS (Steeg), 14=VALTS (Ötztal), 15=Gartner (1900), 16=Schwäbl (1903), 17=Seemüller (1908a), 18=Seemüller (1909d), 19=Seemüller (1909c), 20=Pfalz (1911), 21=Bíró (1918), 22=Haasbauer (1924), 23=Mindl (1924/1925), 24=Kubitschek (1926), 25=Kufner (1957), 26=Kufner (1960), 27=Kufner (1961), 28=Keller (1961) (Linz), 29=Keller (1961), (Gmünden), 30=Maier (1965) (Kiefersfelden), 31=Maier (1965) (Isarwinkel), 32=Bethge & Bonnin (1969), 33=Ibrom (1971), 34=Gladiator (1971), 35=Manherz (1977), 36=Zehetner (1978), 37=Moosmüller (1987), 38=Moosmüller (1991), 39=Noelliste (2017), 40=SBS (Grafrath), 41= SBS (Weilheim), 42=SNiB (Heining), 43=SNiB (Dorfbach), 44=Tschinkel (1908), 45=Bacher (1905), 46=Schweizer (1939), 47=Lessiak (1959), 48=Stolle (1969), 49=Mayer (1971), 50=Kranzmayer (1981), 51=Wolf (1982), 52=Lipold (1984), 53=Rowley (1986).



Map 3.4: East Franconian (EFr) and North Bavarian (NBav). Squares indicate postsonorant velar fronting. 1=Hedrich (1891), 2=Hertel & Hertel (1902), 3=Braun (1906), 4=Dietzel (1908), 5=Gerbet (1908), 6=Blumenstock (1911), 7=Batz (1911) 8=Knupfer (1912), 9=Schmidt (1912b), 10=Heilig (1912), 11=Dellit (1913), 12=Kaupert (1914), 13=Sander (1916), 14=Meinel (1932), 15=Roedder (1936), 16=Werner (1961), 17=Kober (1962), 18=Bock (1965), 19=Steger (1968), 20=Hirsch (1971), 21=Diegritz (1971), 22=Trukenbrod (1973), 23=Jakob (1985), 24=Schnabel (2000), 25=Gradl (1895), 26=Gebhardt (1907), 27=Eichhorn (1908), 28=Seemüller (1908c), 29=Hain (1936), 30=Gütter (1962a), 31=Gütter (1962b), 32=Gütter (1963b), 33=Gütter (1963a), 34=Dozauer (1967), 35=Schödel (1967), 36=Bethge & Bonnin (1969) (Kreis Wunsiedel), 37=Bethge & Bonnin (1969) (Kreis Schwabach), 38=Denz (1977), 39=Götz (1987), 40=Bachmann (2000), 41=SBS (Raitenbuch), 42=SBS (Dettenheim), 43=SBS (Mörnsheim), 44=SNiB (Zinzenzell), 45=SNiB (Herrnsaal), 46=SNiB (Atting), 47=SMF (Heuberg), 48=SMF (Ebenried), 49=SNOB (Miltach).

(22) Postvocalic [x] and [ç] (from /x/):

a.	[ksuxt]	gesucht	'searched-PART'
	[ɔfʊx]	einfach	'simple'
	[voxŋ]	Woche	'week'
	[nəx]	nach	'after'
	[sɑxɛ]	Sache	'thing'
	[ə hɑuxl̩]	ein Hauchl	'hint'
b.	[siçɐ]	sicher	'certainly'
	[pflɪçt]	Pflicht	'duty'
	[ʀeç]	Reh	'deer'
	[ʀɑiç]	Reich	'empire'
c.	[seçi], [seəxi]	sehe ich	'I see'

Examples like the ones in (22) are captured by analyzing [x] and [ç] as underlyingly /x/, which surfaces as [ç] after a coronal sonorant by Velar Fronting-1 (=3). I discuss below why the trigger for fronting is the set of coronal sonorants and not the set of front vowels.

Optional forms as in (22c) show that Velar Fronting-1 is fully transparent. The realization [seəxi] illustrates that Diphthongization (Diphth) preempts Velar Fronting-1; see (23a). That this is a bleeding relationship is shown in (23b) where Diphthongization incorrectly counterbleeds Velar Fronting-1 in /sex-i/. The example /ʀɑix/ shows that Diphthongization and Velar Fronting-1 do not interact.

(23)

a.		/sex-i/	/ʀɑix/	b.		/sex-i/	/ʀɑix/
	Diphth	seəxi	-----		Vel Fr-1	seç-i	ʀɑiç
	Vel Fr-1	-----	ʀɑiç		Diphth	seəç-i	------
		[seəxi]	[ʀɑiç]			*[seəçi]	[ʀɑiç]
		'I see'	'empire'				

The bleeding relationship in (23a) is a specific example of Dialect D from Figure 2.6.

An important difference between Ramsau am Dachstein and Maienfeld/Rheintal (§3.3, §3.4) is that the one rhotic consonant is coronal ([r]) in Maienfeld/Rheintal, but uvular ([ʀ]) in Ramsau am Dachstein (as in the final two examples in 22b). I follow Noelliste in analyzing /ʀ/ as phonologically [dorsal]. As in MoStGm (and many other regional varieties discussed below), /ʀ/ has the back vowel allophone [ɐ] – the vocalized-r – in coda position. The data in (24a) illustrate [ʀ]~[ɐ] alternations in which the consonantal sound occurs in the onset and the vocalized sound in the coda. The data in (24b) are significant because the dorsal fricative /x/ surfaces without change as [x] after the vocalized-r. Noelliste demonstrates that the dialect also vocalizes /l/ to the front vowel [ɪ] in coda position. A representative example (from underlying /mɔlx/) is provided in (24c). Note that the sound following the derived front vowel ([ɪ]) is palatal [ç] as expected because the sound to its immediate left is [coronal].

(24)	a.	[meɐ]	Meer	'ocean'
		[me.ʀə]	Meere	'oceans'
		[pə.piɐ]	Papier	'paper'
		[pə.pi.ʀə]	Papiere	'papers'
	b.	[ʃtɔɐx]	Storch	'stork'
		[kiɐxŋ]	Kirche	'church'
	c.	[mɔɪç]	Molch	'salamander'

The significant point is that [x] – and not [ç] – surfaces after [ɐ]. In fact, this is precisely what one would expect given the transparent distribution of [x] and [ç] because both [x] and [ɐ] are back ([dorsal]) sounds. The realization of /x/ as [x] after the vocalized-r is not simply true for Ramsau am Dachstein. Instead, it is a general characteristic of Austrian German. This point is stressed by Sylvia Moosmüller et al. (2015), who show that velar fronting is present in StAGm, where /x/ surfaces as [x] in words like [kiɐxɛ] 'church'. See also Capell (1979: 12), who notes that the occurrence of [x] after [ɐ] is a general pattern for Bav dialects.

The articulation [ɐx] in a word like [ʃtɔɐx] 'stork' can be contrasted with other varieties of German, which have opaque palatal [ç] in that context, e.g. [ʃtɔɐç] 'stork' in MoStGm (§1.2 and §17.3.1).

The realization of /l ʀ/ as [ɪ ɐ] in (24) is accomplished with (25). Following Noelliste, the underlying sonorant consonants consist of [+nasal] sounds (/m n ŋ/) and [−nasal] sounds (/l ʀ/), while place features distinguish the individual members of those two groups, e.g. /l/ is [coronal] and /ʀ/ is [dorsal]. Liquid Vocalization changes the [dorsal] rhotic /ʀ/ into the [−consonantal] sound [ɐ], but [ɐ] retains [dorsal] since the only feature that changes in (25) is [consonantal].[16]

(25) Liquid Vocalization:

[16] The vocalization of liquids in Bav has been well-documented in the descriptive and theoretical literature. In addition to Noelliste (2017) the reader is referred to Kranzmayer (1956: 119ff.), Rein (1974), and Glover (2014), not to mention the linguistic atlases for Bavaria and Upper Austria (§1.6.2). Map 60 in WDU (Volume 4) depicts the vocalization of /l/ to a front vowel throughout most of Austria and Bavaria.

$$\begin{bmatrix}+\textsc{cons}\\+\textsc{son}\\-\textsc{nas}\end{bmatrix} \longrightarrow [-\text{cons}] \;/\; \underline{\quad\;} \; C_0 \;]_\sigma$$

Liquid Vocalization (Liq Voc) and Velar Fronting-1 do not interact, as illustrated in (26). Thus, [x] surfaces after [ɐ] given either ordering relationship. Observe that /x/ surfaces as [ç] after /l/ in /mɔlx/ because the set of triggers for Velar Fronting-1 consists of all coronal sonorants.

(26)

a.		/ʃtɔʀx/	/mɔlx/
	Liq Voc	ʃtɔɐx	mɔɪx
	Vel Fr-1	-----	mɔɪç
		[ʃtɔɐx]	[mɔɪç]
		‘stork’	‘salamander’
b.		/ʃtɔʀx/	/mɔlx/
	Vel Fr-1	-----	mɔlç
	Liq Voc	ʃtɔɐx	mɔɪç
		[ʃtɔɐx]	[mɔɪç]

The reason the correct version of velar fronting for Ramsau am Dachstein specifies that the trigger is the set of coronal sonorants ([+sonorant, coronal]) and not the set of front vowels ([−consonantal, coronal]) is that there is a small number of words in which /l/ unexpectedly fails to vocalize and surfaces as [l], in which case /x/ is realized with the palatal allophone, e.g. [valç] ‘goatgrass’. The pronunciation with [ç] in that type of word follows directly if the set of triggers for Velar Fronting-1 is [+sonorant, coronal].

In sum, [x] and [ç] have a transparent distribution on the surface: [ç] occurs only after coronal sonorants and [x] after back vowels. The two sounds never contrast.

Modern-day velar and palatal fricatives in Ramsau am Dachstein surface after back vowels and front vowels respectively regardless of the etymological source of those vowels. A palatal after a historical front vowel is provided in (27a) and a velar after a historical back vowel in (27b). The example in (27c) shows that [x] follows an etymological front vowel which now surfaces as a diphthong ending in schwa ([eə]). That vocalic change (Diphthongization) is a specific example of Vowel Retraction (=7a) because the component of the diphthong adjacent to the dorsal fricative in words like the one in (27c) is back. Example (27d) illustrates the change from the modern-day allophone [ɐ] (/ʀ/) from the earlier [coronal] rhotic [r] (/r/). The change from coronal to dorsal was accomplished by the process I refer to below as r-Retraction in (28). The reconstructions in the second column below are my own.

(27)	a.	[ʀɑiç]	<	+[riːx]	'empire'	cf. MHG *rīch(e)*	(from 22b)
	b.	[nəx]	<	+[nɑːx]	'after'	cf. MHG *nāch*	(from 22a)
	c.	[seəxi]	<	+[sexi]	'I see'	cf. MHG *sehe ich*	(from 22c)
	d.	[ʃtɔɐx]	<	+[stɔrx]	'stork'	cf. MHG *storch(e)*	(from 24b)

(28) r-Retraction:
/r/ > /ʀ/

From the formal perspective r-Retraction deleted [coronal] and added [dorsal]. That change is assumed to have involved a restructuring of the underlying representation because it was obligatory and did not create alternations.[17]

Before I continue my discussion of velar fronting in Ramsau am Dachstein from the diachronic perspective I provide some background on the phonology of rhotics necessary to better understand the function of r-Retraction, since that sound change plays an important role in a number of case studies investigated below. A number of proposals have been made concerning the nature of the rhotic consonant phoneme in the history of Gmc; a few of those studies penned in the modern era include Runge (1973), Howell (1991), King & Beach (1998), Denton (2003), and Kostakis (2015). Some of that earlier research has proposed that the phonetic variation involving the manner and place of articulation for the rhotic consonant in modern German (Kohler 1977, Hall 1993) was already present in early Gmc and that the different realizations of the early Gmc rhotic can shed light on sound changes that were triggered by it.

A significant generalization that is sometimes missed in that earlier discussion is that there never was a single variety of Gmc with a rhotic displaying either a manner contrast (trill, approximant, flap) or place contrast (alveolar, velar, uvular). Since the present discussion concerns itself with the place dimension, I state the following generalization which is true for German dialects without exception: There are German dialects with a [coronal] rhotic (/r/) and those with a [dorsal] rhotic (/ʀ/), but no variety of German contrasts the two sounds. In the present framework I therefore posit that the one rhotic phoneme can differ from dialect to dialect in terms of its distinctive features; recall the two structures posited in (3c,d) in §2.2.2. Thus, there are dialects like Erdmannsweiler, Maienfeld, Rheintal, and Upper Austria (see §3.6) where /r/ is phonologically [coronal], as well as ones like Ramsau am Dachstein where /ʀ/ is phonologically [dorsal].

[17]The treatment described here is also compatible with one in which r-Retraction is active as a synchronic rule. I leave this possibility open.

r-Retraction in (28) can be viewed as a sound change that has the function of changing the [coronal] rhotic phoneme into a [dorsal] rhotic phoneme. The example given earlier in (27d) means that Ramsau am Dachstein was once a dialect with /r/ and that r-Retraction restructured it to /ʀ/. Evidence for my claim is that the rhotic phoneme in the broader region (Austria) is primarily [coronal] (/r/) and that areas that once had /r/ now have /ʀ/. See in particular Kranzmayer (1956: 121), who observes that Bav dialects with the [dorsal] rhotic – *Zäpfchen-r* ('uvular-r') in Kranzmayer's terms – are gradually spreading throughout several regions in Austria where the [coronal] rhotic – Kranzmayer's Zungen-r ('tongue [tip]-r') – was once predominant.[18]

Velar Fronting-1 in modern-day Ramsau am Dachstein (Stage 2) arose out of Stage 1, where /x/ surfaced invariably as [x]. The two stages referred to here are depicted in (29) for three of the items presented above:

(29)	/pflɪxt/	/sɑxɛ/	/stɔrx/	
	[pflɪxt]	[sɑxɛ]	[stɔrx]	Stage 1
	/pflɪxt/	/sɑxɛ/	/ʃtɔʀx/	
	[pflɪçt]	[sɑxɛ]	[ʃtɔɐx]	Stage 2
	Pflicht	*Sache*	*Storch*	MoStGm
	'duty'	'thing'	'stork'	

As noted above, the realization of /x/ as [x] after both back and front vowels at Stage 1 attested in SBav varieties, e.g. Imst (Schatz 1897, Hathaway 1979; Figure 3.3). The coronal articulation of the rhotic ([r]) is the realization of /r/ in the Swb and HAlmc varieties discussed above (Figure 3.1, Figure 3.2). [r] (/r/) is also the realization among speakers of SBav spoken in the Oberinntal (Upper Inn Valley) to the West of Innsbruck (as observed by Schatz 1897: 6, 11). The same point holds for the SBav variety in Samnaun in the far eastern part of Switzerland (Gröger 1924: 126; Figure 3.3).

At some point at Stage 1, /x/ was slightly fronted in the context after a front vowel (i.e. it was prevelar), and at Stage 2 that coarticulatory process of velar

[18]It is often assumed in the traditional literature that the original language (PGmc) had /r/ and that modern German dialects with /ʀ/ were therefore all innovative. The treatment of Ramsau am Dachstein described above is consistent with that approach. Alternatively, one could argue that even in earlier stages of Gmc (e.g. OHG, MHG) dialects with /r/ and dialects with /ʀ/ coexisted side by side; note that the latter approach is more in line with the findings of Howell (1991) than the former one. In this book I do not discuss cases where a [dorsal] rhotic is preserved from an earlier system with a [dorsal] rhotic, although I do not deny that that type of system could be attested. It is important to stress that the [dorsal] rhotic phoneme in many of the case studies discussed below (Chapter 7) must have been [coronal] at an earlier stage.

fronting was phonologized as Velar Fronting-1, which now applies categorically after front vowels and coronal consonants (=[+sonorant, coronal]).

The pattern of velar fronting in Ramsau am Dachstein exemplifies the default case discussed earlier for Erdmannsweiler (§3.2) in the sense that /x/ surfaces as [ç] after any coronal sonorant. That same default pattern is the one attested in other varieties of CBav spoken in both Austria and Germany (Bavaria). One Austrian variety documenting the presence of the default pattern approximately one century ago is Pfalz's (1911) phonetic study of consonants and vowels in Marchfeld (Figure 3.3). The material in the latter source reveals that [ç] only surfaces after front vowels and [x] after back vowels. Since liquids are vocalized (as in 24b,c), there do not appear to be examples in Pfalz (1911) where dorsal fricatives surface after consonants. As in Ramsau am Dachstein, [x] surfaces after the vocalized-r ([ɐ]).

The same default pattern involving [x] and [ç] has been observed for well over a century in descriptions of CBav dialects spoken in Bavaria. One older source stating that the palatal only occurs after a front vowel and the velar after a back vowel is Schwäbl (1903: 46) for the Rot-Tal region (Figure 3.3). Kufner (1957: 178–179, 1960: 12–13) makes the same observation concerning the realization of [x] and [ç] in the same region (Figure 3.3). The status of velar fronting in Bav with particular reference to Lower Bavaria is the topic of Chapter 13.

3.6 Central Bavarian (part 2)

Haasbauer (1924) provides a historical description of the consonants and vowels of a broad CBav-speaking region in the Austrian state of Upper Austria (Oberösterreich; Figure 3.3).

The phonemic monophthongs and diphthongs differ slightly from community to community. The data presented below have dorsal fricatives in the neighborhood of front vowels (/i ɪ e ɛ/), back vowels (/u o ɔ ɑː ɑ ə/), diphthongs ending in a front vowel (/ɔɪ æɛ/) or diphthongs ending in a back vowel (/uɒ/). The only dorsal fricatives are [x] and [ç], which stand in an allophonic relationship in postsonorant position as in (1). Neither sound occurs word-initially.

[x] surfaces after back vowels (=30a) and [ç] after front vowels (=30b) or the vocalized /l/ (=30c); see Haasbauer (1924: 100) for discussion of the phonetics of [x] and [ç]. No data were found in the original source in which /r/ occurs before /x/. The diachronic source for [x]/[ç] is WGmc $^{+}$[k x].

(30) [x] and [ç] (from /x/):

a.	khuxü̧	[kʰuxʏ]	Küche	‘kitchen’	92
	woxɒ	[woxɒ]	Woche	‘week’	91
	bǫxɒ	[bɔxɒ]	backen	‘bake-INF’	107
	suɒxɒ	[suɒxɒ]	suchen	‘search-INF’	107
	gɑx	[gɑːx]	jäh	‘abruptly’	92
	bɑxd	[bɑxt]	Gebäck	‘pastry’	107
b.	siχɒ	[siçɒ]	sicher	‘certainly’	107
	seχtɒ	[seçtɒ]	Gefäß	‘container’	89
	šlę̄χd	[ʃlɛçt]	schlecht	‘bad’	107
	ǫi̯χŋ	[ɔɪçŋ̍]	Eiche	‘oak tree’	97
	fæęχtn	[fæɛçtn̩]	Fichte	‘spruce’	95
c.	mui̯χ	[muɪç]	Milch	‘milk’	90

The data in (30) are captured by analyzing [x] and [ç] as underlyingly /x/, which surfaces as [ç] after a coronal sonorant by Velar Fronting-1 (=3).

The importance of the patterning of dorsal fricatives in Upper Austria lies in the realization of /r/. In most areas in Upper Austria, that sound is coronal [r] in word-initial position (in 31a) or in a word-internal onset (in 31b). Haasbauer describes the sound as an untrilled dental-r (‘ungerolltes Zungen-r’), although he also notes that some areas have a dorsal (uvular) articulation (‘Zäpfchen-r’; Haasbauer 1924: 100). The most significant examples are the ones in (32), which illustrate the realization of /r/ in coda position after a vowel and before a fortis obstruent. The generalization is that /r/ surfaces as [x] after a back vowel (in 32a) or as [ç] after a front vowel (in 32b). The data in (32) are typical of the Hausruckviertel, although similar examples obtain elsewhere, e.g. in the region around Ebensee and in the northwest of the Salzkammergut.[19]

[19] A number of studies have documented the realization of the rhotic phoneme as a fortis dorsal fricative before fortis sounds like [t] in varieties of Bav. See, for example, Schönberger (1934: 77–78), Roitinger (1954: 203–207), Kranzmayer (1956: 124–127), and Zehetner (1978: 298–299). In contrast to Haasbauer, the aforementioned authors employ a single symbol representing a fortis dorsal fricative (e.g. ⟦x⟧ or ⟦χ⟧) without saying explicitly whether or not that sound can be realized as a palatal. The linguistic atlas for Upper Austria (SAO) indicates certain parts of Upper Austria (e.g. to the north and west of Wels) where etymological /r/ surfaces as a fricative after a back vowel. For example, it is stated in the commentary for Map I 64 for the word *schwarz* ‘black’ that the fricative realization for /r/ is velar. /r/ is likewise realized as a fricative after a front vowel in the word *Herz* ‘heart’ on Map I 98, but that map does not distinguish velar from palatal place of articulation. The same drawback holds for Maps 69 (for *Wort* ‘word’) and Map 70 (for *Herzen* ‘heart-DAT SG) in the *Kleiner Deutscher Sprachatlas* (KDSA). According to those maps, there is a region in Austria between Innsbruck, Salzburg, and Linz, as well as parts of Bavaria to the south and west of München, where the /rt/ and /rts/

(31) Postrhotic [x] and [ç] (from /r/):

a.	ruɒ	[ruɒ]	Ruhe	'quiet'	105
b.	mǫriŋ	[mɔ.riŋ]	morgen	'tomorrow'	105

(32) Postrhotic [x] and [ç] (from /r/):

a.	gfiɒxd	[gfiɒxt]	geführt	'led-PART'	105
	šwǫxds	[ʃwɔxts]	schwarz	'black'	105
b.	meχkɒ	[meçkɒ]	merken	'notice-INF'	105
	gšbeχt	[gʃpeçt]	gesperrt	'blocked-PART'	90
	hęχds	[hɛçts]	Herz	'heart'	105

The dorsal fricatives [x ç] in (32) derived historically from a rhotic (WGmc ⁺[r]). My assumption is that these and similar words retain /r/ in the underlying representation in the synchronic phonology, e.g. /ʃwɔrts/ for [ʃwɔxts] and /hɛrts/ for [hɛçts]. First, speakers with the pronunciation in (32) are certainly aware of the fact that these items surface with [r] in neighboring areas of Upper Austria, e.g. [meːrkɒ] 'notice-INF' for [meçkɒ] in (32b). Second, [r] presumably surfaces as an alternant in a word-internal onset for the items listed in (32) in which the fortis consonant following the dorsal fricative is an inflectional suffix, e.g. the /r/ in [gʃpeçt] 'blocked-PART' (from /g-ʃper-t/), cf. MoStGm [ʃpɛʀən] 'block-INF' (from /ʃpɛʀ-ən/). Unfortunately, Haasbauer does not provide alternating examples.

The /r/ in (32) undergoes a change to a fortis velar fricative |x|, which in turn feeds Velar Fronting-1. It is possible to account for the change from /r/ to |x| in a single step; I posit two separate changes (in 33) on the basis of my treatment of a CGm (Rpn) dialect in which two similar rules are synchronically motivated (§5.3.1). Desonorization-1 converts /r/ into a dorsal obstruent (|ʁ|), while Laryngeal Assimilation-1 ensures that obstruents (including derived |ʁ|) shift to a fortis sound (e.g. |x|) before a fortis obstruent. The two changes described here are illustrated representationally in (34). I assume that the feature [−nasal] is not present in |ʁ| or [x], although this point is not crucial. Laryngeal Assimilation-1 is an example of a change that increases the number of target segments for Velar Fronting-1 (=Rule W from Table 2.7).

(33) a. Desonorization-1:

sequences in those two words are realized as ⟦cht⟧ and ⟦chz⟧ respectively. There can be little doubt that ⟦ch⟧ on the KSDA maps represents a (fortis) dorsal fricative, but it is not possible – given the broad transcription – to conclude that it is [x] or [ç]

$$\begin{bmatrix} +\textsc{cons} \\ +\textsc{son} \\ -\textsc{nasal} \\ +\textsc{cont} \\ \textsc{coronal} \end{bmatrix} \longrightarrow \begin{bmatrix} -\textsc{son} \\ \textsc{dorsal} \end{bmatrix} \;/\; \underline{\quad} \begin{bmatrix} -\textsc{son} \\ +\textsc{fortis} \end{bmatrix}$$

b. Laryngeal Assimilation-1:

$$\begin{bmatrix} -\textsc{son} \end{bmatrix} \longrightarrow \begin{bmatrix} \textsc{fortis} \end{bmatrix} \;/\; \underline{\quad} \begin{bmatrix} -\textsc{son} \\ +\textsc{fortis} \end{bmatrix}$$

(34)
$$\begin{array}{ccccc} /\text{r}/ & \xrightarrow{\text{Deson-1}} & |\text{ʁ}| & \xrightarrow{\text{Lar Assim-1}} & |\text{x}| \\ \begin{bmatrix} +\textsc{cons} \\ +\textsc{son} \\ -\textsc{nasal} \\ +\textsc{cont} \end{bmatrix} & & \begin{bmatrix} +\textsc{cons} \\ -\textsc{son} \\ +\textsc{cont} \end{bmatrix} & & \begin{bmatrix} +\textsc{cons} \\ -\textsc{son} \\ +\textsc{cont} \\ +\textsc{fortis} \end{bmatrix} \\ | & & | & & | \\ \begin{bmatrix} \textsc{coronal} \end{bmatrix} & & \begin{bmatrix} \textsc{dorsal} \end{bmatrix} & & \begin{bmatrix} \textsc{dorsal} \end{bmatrix} \end{array}$$

As a representative example, consider the word [hɛçts] (from 32b) in (35a): Desonorization-1 (Deson-1) creates |ʁ|, which undergoes Laryngeal Assimilation-1 (Lar Assim-1), thereby resulting in |x|. That derived fricative surfaces as palatal by Velar Fronting-1. The word [ʃlɛçt] 'bad' (from 30b) in (35a) represents an example with /x/ after a front vowel for comparison. Laryngeal Assimilation-1 cannot counterfeed Velar Fronting-1, as shown in (35b).

(35) a.

	/hɛrts/	/ʃlɛxt/
Deson-1	hɛʁts	-----
Lar Assim-1	hɛxts	-----
Vel Fr-1	hɛçts	ʃlɛçt
	[hɛçts]	[ʃlɛçt]
	'heart'	'bad'

b.

	/hɛrts/	/ʃlɛxt/
Deson-1	hɛʁts	-----
Vel Fr-1	-----	ʃlɛçt
Lar Assim-1	hɛxts	-----
	*[hɛxts]	[ʃlɛçt]

In sum, (35a) demonstrates that the surface distribution of [x] and [ç] is transparent and not opaque. The feeding relationship between Laryngeal Assimilation-1 and Velar Fronting-1 in (35a) is similar to the feeding relationship depicted for Dialect A in Figure 2.5.

The importance of the Upper Austrian data in (32) is made clear in §5.3 where I show that underapplication opacity as in (35b) is correct other dialects.

3.7 Conclusion

In three of the UGm varieties discussed above (Erdmannsweiler, Maienfeld, Ramsau am Dachstein) a default pattern was established, whereby a single velar target segment (/x/) is realized as the corresponding palatal ([ç]) after a set of triggers defined as the class of all coronal sonorants. Elsewhere – that is, after a back vowel – /x/ is realized without change as [x]. However, that default pattern is not what one finds in the data from Rheintal. First, the set of triggers is narrower than the one for the default pattern in the sense that it only consists of [−low] front vowels or a coronal sonorant consonant. Second, the set of targets is broader than in the default pattern because it includes not only the fricative /x/ but also another velar sound, namely the affricate /kx/. The conclusion is that one cannot know for certain whether or not the default pattern holds for any given velar fronting variety. It is therefore essential for any cross-dialectal study to determine for any given variety both (a) the set of velar sounds that undergo fronting (targets), and (b) the set of sounds that induce fronting (triggers).

Rheintal is also significant because it exemplifies an allophonic distribution of velar and palatal in word-initial position. A cross-dialectal analysis like the present one therefore needs to consider the patterning of velar and palatal sounds in word-initial position (if present) and to determine the set of targets and triggers for that fronting process.

A final point worth emphasizing is that the occurrence of palatals in the neighborhood of front sounds and velars in the neighborhood of back sounds holds regardless of the historical source of the sounds that induce fronting. In all of the dialects discussed above, palatals like [ç] occur not only after front segments that were historically front but also after front sounds that were historically back. The processes fronting sounds like /x/ to [ç] were therefore transparent because they were fed by historical changes of Vowel Fronting, e.g. i-Umlaut. Likewise, velars like [x] surface after back segments that were historically back, but also after back segments that were historically front. Sound changes creating back sounds from front sounds (r-Retraction, Vowel Retraction) therefore bled the fronting processes that created palatals from velars. Finally, the sounds undergoing velar fronting (targets) include not only underlying velar sounds but also new velars created other changes (Laryngeal Assimilation-1).

4 Allophony (part 2)

4.1 Introduction

The present chapter investigates the allophonic distribution of velars like [x] and palatals like [ç] in three varieties of WLGm. In contrast to the UGm dialects discussed in Chapter 3 the WLGm varieties considered below possess one or two lenis dorsal fricatives, namely velar [ɣ] and palatal [ʝ], in addition to [x] and [ç]. Three systems are compared (System A-C), which are defined according to the target segments for postsonorant velar fronting. In System A the set of targets comprises /x/ as well as the lenis dorsal fricative (|ɣ|) produced from an underlying /g/ in coda position. That synchronically derived fricative |ɣ| surfaces in coda position as [ç] after a coronal sonorant and as [x] after a back vowel. In System B /x/ surfaces as [ç] after a coronal sonorant, but /ɣ/ is realized as [ɣ] in a word-internal onset (e.g. between vowels) even if the segment preceding /ɣ/ is a front vowel. However, /ɣ/ is realized as [x] or [ç] in coda position after a back or front vowel respectively. In System C [ʝ] and [ɣ] are positional variants (as are [x] and [ç]); hence, the two palatals [ç ʝ] derive synchronically from the corresponding velars (/x ɣ/) by a version of velar fronting. The conclusion is that velar fronting differs according to the target segments: In System B the target is /x/ (but not /ɣ/), in System C the target consists of both /x/ and /ɣ/, and in System A it cannot be determined if the target consists of the fortis velar fricative only (/x/ and |x| from /ɣ/) or /x/ and the derived lenis sound |ɣ| before it hardens to |x|. The triggers for velar fronting consist of coronal sonorants in System A-C, although it is demonstrated below that the rule fronting /x/ in a word-initial onset to [ç] in System B and System C is triggered only by front vowels but not by coronal sonorant consonants.

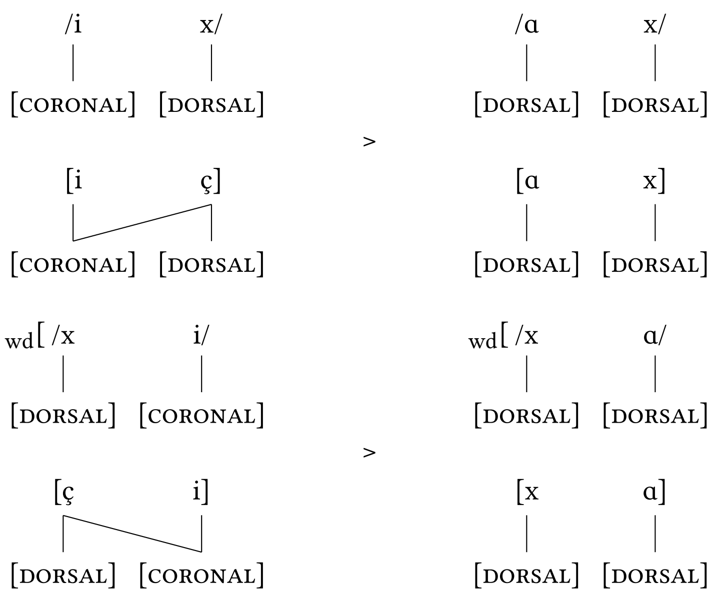
In all three dialects the lenis palatal fricative [ʝ] (/ʝ/) surfaces in word-initial position before front vowels and back vowels. That sound was referred to in §2.4.3 as the etymological palatal because it derived historically from the homorganic glide (WGmc $^{+}$[j]). Since the [ʝ] in question never derived historically from a velar sound, its occurrence in the context of back vowels does not involve opacity, i.e. the overapplication of velar fronting.

The purely transparent distribution of palatals (in the neighborhood of front sounds) and velars (in the neighborhood of back sounds) holds regardless of the historical source of the triggers for velar fronting. For example, velars like [x] occur not only in the context of back segments that were historically back but also when adjacent to back sounds that were historically front (Vowel Retraction, r-Retraction). Likewise palatals like [ç] surface in the context of front sounds that were etymologically front as well as front sounds that were etymologically back (Vowel Fronting). The sounds undergoing velar fronting included not only underlying velars but also new velars created by independent changes.

The effect retractions and frontings had on the triggers for the fronting of velars was discussed in Chapter 3. In (1) and (2) I exemplify the formal aspects of those changes. (1) depicts retraction, where "i" and "ɑ" represent front and back sounds and "x" and "ç" a velar and a palatal. (1a) depicts postsonorant position and (1b) word-initial position. Retraction (i.e. Vowel Retraction/r-Retraction) is expressed in (1) as /i/ > /ɑ/. The multiple link between the two features [coronal] and [dorsal] to the left of the wedge in the phonetic representation is created by the synchronic rule of velar fronting. Since the front sound in the trigger of fronting is replaced with a back sound (after the wedge) it can be said that the processes of retraction bled fronting.

(1) a.

b.



In (2) I illustrate how the change shifting back sounds to front sounds (Vowel Fronting) affected the fronting of velars in postsonorant position (in 2a) and word-initial position (in 2b). Velar fronting is not present to the left of the wedge in (2a) or (2b) because the back segment is not a trigger. When that back sound is restructured as front (/ɑ/ > /i/) the velar then fronts to palatal; hence, Vowel Fronting feeds the fronting of velars.

(2) a.

/ɑ	x/		/i	x/
[DORSAL]	[DORSAL]	>	[CORONAL]	[DORSAL]
[ɑ	x]		[i	ç]
[DORSAL]	[DORSAL]		[CORONAL]	[DORSAL]

b.

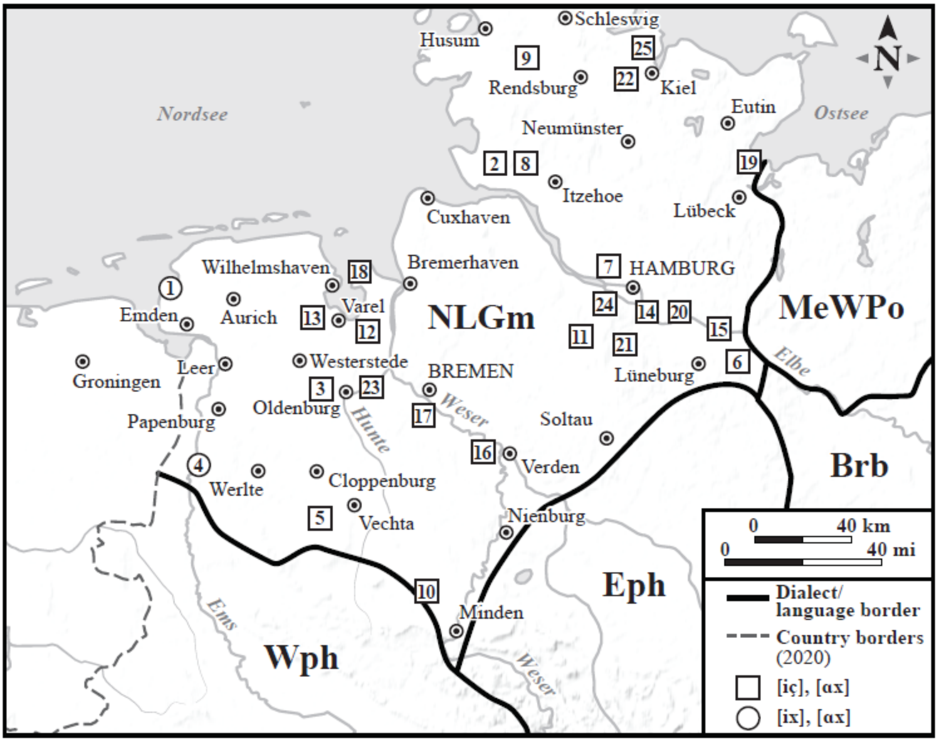
$_{\text{wd}}$[/x	ɑ/		$_{\text{wd}}$[/x	i/
[DORSAL]	[CORONAL]	>	[DORSAL]	[DORSAL]
[x	ɑ]		[ç	i]
[DORSAL]	[DORSAL]		[DORSAL]	[CORONAL]

I discuss three WLGmc varieties (corresponding to System A-C referred to above), namely NLGm (§4.2), Wph (§4.3), and Eph (§4.4). In §4.5 I provide some discussion, and in §4.6 I conclude.

4.2 North Low German

In the dialect discussed below (System A) a velar target – either /x/ or the spirantized realization of /g/ – surfaces as palatal after a coronal sonorant and elsewhere (after a back vowel) as velar.

Larsson (1917) describes a NLGm dialect spoken in Altengamme (Figure 4.1). The dialect has phonemic front vowels (/iː ɪ yː ʏ eː ɛ øː œ/), back vowels (/uː ʊ oː o ɔ ɑ ə/), diphthongs ending in a front vowel (/ɔɪ ɑɪ/), and diphthongs ending in a back vowel (/øʊ ɔʊ ɑʊ/). There are three dorsal fricatives [x ç ʝ]. The lenis velar [ɣ] does not occur on the surface, although that sound (|ɣ|) is created by a rule spirantizing /g/. It is clear from the discussion of the phonetics in the original source (Larsson 1917: 11–12) that [ʝ] is a fricative and not a glide.



Map 4.1: North Low German (NLGm). Squares indicate postsonorant velar fronting, circles indicate no postsonorant velar fronting. 25 is a variety of High German spoken in Kiel. 1=Hobbing (1879), 2=Kohbrok (1901), 3=vor Mohr (1904), 4=Schönhoff (1908), 5=Vehslage (1908), 6=Rabeler (1911), 7=Kloeke (1914), 8=Stammerjohann (1914), 9=Sievers (1914), 10=Larsson (1917), 11=Götze (1922) (Hollenstedt), 12=Götze (1922) (Jade), 13=Heigener (1937), 14=Schmeding (1937), 15=Feyer (1939), 16=Feyer (1941), 17=Bollmann (1942), 18=Schmidt-Brockhoff (1943), 19=Pühn (1956), 20= von Essen (1958), 21=Keller (1961), 22=Bethge & Bonnin (1969) (Kiel), 23=Mews (1971), 24=Höder (2010), 25=Glover (2011), Glover (2014)

As shown in (3), Altengamme has two underlying dorsal fricatives: /x/ and /ʝ/. The dialect also has a phonemic /g/ which I include in (3) because it participates in morphophonemic alternations with [x] and [ç]. The sounds in (3a) occur word-initially and the ones in (3b) after a sonorant. Appendix H provides a list of the contrastive consonants for LGmc dialects like Altengamme.

(3) a. /ʝ/ /g/

[ʝ] [g]

b. /x/ /g/

[x] [ç] [g]

The formalism in (3) expresses traditional phonemes and allophones only; hence, it is not intended to capture morphophonemic alternations between two or more underlying segments, e.g. between [g] and [x]/[ç] alluded to above.

The only context in which [ʝ] surfaces is word-initial. That sound is the etymological palatal because it is the modern realization of an earlier palatal glide (WGmc +[j]). It is clear from the appendix in Larsson (1917) that there are no constraints on the type of vowel following [ʝ]. For example, [ʝ] can occur before a back vowel (in 4a) or front vowel (in 4b). Word-initial [ʝ] contrasts with [g] (<WGmc +[ɣ]), which likewise surfaces before any back vowel (in 7c) or front vowel (in 4d). Singular-plural pairs like [gɑs]~[gɛs] 'guest~guests' show that [g] does not alternate with [ʝ] before a front vowel (cf. data from Dingelstedt am Huy in §8.4). [ʝ] does not surface in a word-internal onset (e.g. between vowels) because (i) WGmc +[j] in that context either deleted or turned into an other sound, and (ii) there were no sound changes that introduced new instances of [ʝ] in a word-internal onset. By contrast, [g] (<WGmc +[ɣ]) surfaces in a word-internal onset after a back vowel (in 4e) or front vowel (in 4f). [k]~Ø alternations (in 4g) are captured synchronically with an underlying /g/ that surfaces as [k] by in coda position by Final Fortition (see below), e.g. /lɑŋg/⟶[lɑŋk] or by a process deleting /g/ before a vowel, e.g. /lɪŋg-r/⟶[lɪŋɐ].

(4) Word-initial [ʝ] (from /ʝ/) and [g] (from /g/):

a.	jamɑ	[ʝɑmɐ]	Jammer	'lament'	11
b.	jȳ	[ʝyː]	ihr	'you-PL'	79
c.	gas	[gɑs]	Gast	'guest'	87
d.	gɪf	[gɪf]	Gift	'poison'	114
e.	mōgɑ	[moː.gɐ]	mager	'lean'	88
f.	zēgl̩	[zeː.gl̩]	Segel	'sail'	88

g.	laŋk	[laŋk]	lang	'long'	120
	lɪŋɑ	[lɪŋɐ]	länger	'longer'	120

Velar [x] only occurs after a back vowel (in 5a) and palatal [ç] after a front vowel (in 5b) or sonorant consonant (in 5c).[1] From the synchronic perspective, [x ç] in (5) are the realization of the phoneme /x/. Altengamme [x ç] in (5) have several diachronic sources (WGmc ⁺[x ɣ gg f]), all of which restructured to /x/. The original [ɣ] in words like [fo:x] in (5a) and [fɛlç] in (5c) is synchronically /x/ and not /g/ because there is no alternant with [g]. Examples like these therefore differ from the alternating examples discussed below.

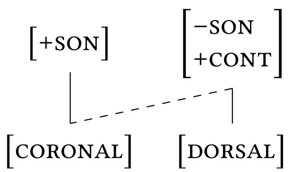
(5) [x] and [ç] (from /x/):

a.	buxt	[bʊxt]	Bucht	'bay'	109
	fōx	[fo:x]	Vogt	'reeve'	113
	nɔx	[nɔx]	noch	'still'	123
	axtɑ	[ɑxtɐ]	hinter	'behind'	84
	høux	[høʊx]	hoch	'high'	86
b.	brχ	[bɪç]	Beichte	'confession'	108
	bryχ	[brʏç]	Brücke	'bridge'	109
	fɛχən	[fɛçən]	fechten	'fence-INF'	86
c.	fɛlχ	[fɛlç]	Felge	'wheel rim'	112

As in all of the dialects discussed in this book, the front vowel in Umlaut-induced alternations regularly conditions the occurrence of [ç], e.g. [pœç] 'frogs' (cf. [pɔx] 'frog').

Velar /x/ in (5) surfaces as palatal [ç] after a coronal sonorant by Velar Fronting-1 (§3.2), which is repeated in (6). Elsewhere (after back vowels) /x/ is realized as [x].

(6) Velar Fronting-1:



[1] [ç] does not occur after [r] because the latter sound either deletes or merges together with a preceding vowel before a labial or velar (Larsson 1917: 42–48). The two sounds in the [nç] sequence present in other dialects are separated by a vowel, e.g. Altengamme [manɪçmɔʊl] 'sometimes'; cf. MoStGm [mançma:l]. There are a few gaps involving long vowels (e.g. [e:]) in 5a,b) which are accidental because they occur in the words with [g] alternations introduced below in (7).

Since Altengamme does not have /ɣ/ there is no reason for the target segment (/x/) to be specified for a laryngeal feature ([+fortis]). However, underlying /ʝ/ in words like the ones in (4a,b) is a complex (corono-dorsal) fricative marked [−fortis]. /ʝ/ must bear that feature to make its representation distinct from the corono-dorsal structure for the derived palatal [ç]. This assumption concerning features holds not only for Altengamme but for all other dialects with /x/ and /ʝ/.

A second source for [x] and [ç] can be observed in (7). These items illustrate a regular alternation between [g] and [x] after a back vowel (in 7a) or between [g] and [ç] after a front vowel (in 7b-d). The original source suggests that there are no constraints on the type of back vowel in (7a) or front vowel in (7b-d) that occur before these dorsal sounds. The [g] in (7) is in a word-internal onset, as reflected in the syllable boundaries in the phonetic representations. [g x ç] in (7) derived historically from WGmc $^{+}$[ɣ] (/ɣ/).

(7) [g]~[x]/[ç] alternations (from /g/):

a.	frōgŋ	[froː.gŋ]	fragen	‘ask-INF’	113
	frōx	[froːx]	Frage	‘question’	113
b.	flåɪgŋ	[flɔɪ.gŋ]	fliegen	‘fly-INF’	113
	flăɪχ	[flaɪç]	Fliege	‘fly’	113
c.	drēgŋ	[dreː.gŋ]	tragen	‘carry-INF’	40
	drēχ	[dreːç]	trage	‘carry-1SG’	40
	drɪχs	[drɪçs]	trägst	‘carries-2SG’	40
d.	låɪgŋ	[lɔɪ.gŋ]	lügen	‘lie-INF’	66
	lyχs	[lʏçs]	lügst	‘lies-2SG’	77
	lø̄χ	[løːç]	Lüge	‘lie’	121

The coda /g/ in (7) undergoes Final Fortition (in 8a) and g-Spirantization-1 (in 8b).[2] g-Spirantization-1 does not affect [+fortis] /k/, which surfaces in coda position without change, e.g. [lɔk] ‘hole’ (from /lɔk/).

(8) a. Final Fortition:

$$[-\text{sonorant}] \longrightarrow [+\text{fortis}] \;/\; \_\_\_\; \mathrm{C}_0\,]_\sigma$$

[2] I have been unable to find examples in which [g] alternates with [ç] after a consonant ([l]). (5c) appears to be such an example, but as noted above, the dorsal fricative in that item does not have an alternant with [g]. Final Fortition derives independent support from fortis vs. lenis alternations, e.g. [grɑs] ‘grass’ vs. [grɔʊ.zn̩] ‘graze-INF’. The reason the alternations like those derive from a lenis sound (/z/) which undergoes fortition in the coda and not from a fortis sound (/s/) which lenites in the onset is that there are items like [laɪ.sn̩] ‘afford-INF’ in which [s] (from /s/) surfaces in a word-internal onset.

b. g-Spirantization-1:

$$\begin{bmatrix} -\textsc{son} \\ -\textsc{cont} \\ -\textsc{fortis} \\ \textsc{dorsal} \end{bmatrix} \rightarrow [+\textsc{cont}] \ / \ [-\textsc{cons}] \ \_\_ \ C_0 \ ]_\sigma$$

On the basis of the data in Larsson (1917) the set of vocalic ([−consonantal]) triggers for g-Spirantization-1 is the entire natural class of front vowels.

Final Fortition (Fnl For) and Velar Fronting-1 (Vel Fr-1) create transparent outputs, as shown in (9a) for [dreːç] (/dreːg/) from (7c). The /g/ in that type of example is parsed as a coda and therefore shifts to |ɣ| by g-Spirantization-1 (g-Spir-1). That derived |ɣ| hardens to [x] and then surfaces as [ç] by Velar Fronting-1.

(9) a.

	/dreːg/
g-Spir-1	dreːɣ
Fnl Fort	dreːx
Vel Fr-1	dreːç
	[dreːç]
	'carry-1sg'

b.

	/dreːg/
g-Spir-1	dreːɣ
Vel Fr-1	dreːʝ
Fnl Fort	dreːç
	[dreːç]

Alternatively, |ɣ| undergoes Velar Fronting-1 to |ʝ| and then Final Fortition to [ç], as in (9b). (9) illustrates that Final Fortition and Velar Fronting-1 are not ordered.[3]

As noted in (4), word-initial palatal [ɟ] (/ɟ/) derived historically from the corresponding glide (WGmc ⁺[j]), while [g] (/g/) is the reflex of WGmc ⁺[ɣ]. The changes affecting those original sounds are stated in (10):

(10) a. Glide Hardening:
WGmc ⁺/j/ > /ɟ/ $_\sigma$[____

b. g-Formation-1:
WGmc ⁺/ɣ/ > /g/

Glide Hardening is a very general change in LGmc and CGm; see Hall (2014b) and Appendix F. As observed in Hall (2014b) that change affected all glides and not simply WGmc ⁺[j]. WGmc ⁺[ɣ] is realized as the corresponding stop ([g]) throughout UGm and in many CGm and LGm varieties (=10b). Altengamme represents dialects where every instance of WGmc ⁺[ɣ] shifted to [g]; other dialects discussed below in Chapter 8 only affect WGmc ⁺[ɣ] in certain contexts but not others (e.g. word-initially).

[3] Final Fortition counterbleeds g-Spirantization-1 in either scenario, otherwise the underlying /g/ in a word like /dreːg/ would shift to |k| in the coda and bleed g-Spirantization-1. However, the counterbleeding ordering described here does not involve opaque overapplication effects (recall §2.2.4).

The distribution of velars and palatals in Altengamme holds regardless of the historical source of the triggers for Velar Fronting-1. Thus, dialect-specific sound changes shifting original back vowels to front vowels (i-Umlaut as an example of Vowel Fronting) fed Velar Fronting-1, e.g. [pœç] 'frogs' (cf. [pɔx] 'frog'). The formal change in that type of example is depicted in (2a). The change from an etymological front vowel to a back vowel (Vowel Retraction) appears not to be attested in Altengamme.

The pattern described above differs from what is found in other varieties of NLGm, especially those in the vicinity of the Dutch border. For example, in Lathen (Schönhoff 1908; Figure 4.1) there is a contrast between the etymological palatal [ʝ] (<WGmc +[j]) and velar [ɣ] (<WGmc +[ɣ]) in word-initial position (§8.2). Since /ɣ/ surfaces consistently as [ɣ] even before front vowels there is no velar fronting in word-initial position. In that same variety velar fronting is also absent in postsonorant position, since [x] (<WGmc +[x]) and [ɣ] (<WGmc +[ɣ]) surface as velars even after front vowels. Thus, Lathen mirrors Dutch, e.g. [zɛx] 'say-1sg'

In those varieties of NLGm with postsonorant fronting that process is characterized by the broad set of triggers, as in Altengamme. Hence, [ç] (from /x/ or /g/) only surfaces after a coronal sonorant and [x] only after a back vowel, e.g. Oldenburg (vor Mohr 1904), Finkenwärder (Kloeke 1914), Kreis Herzogtum Lauenburg (Heigener 1937), Grambkermoor (Bollmann 1942) and Hemmelsdorf (Pühn 1956). All of these places as well as other ones for similar NLGm dialects are indicated on Figure 4.1.

4.3 Westphalian

Wph represents a branch of LGm which exhibits little consistency with respect to the distribution of dorsal fricatives. I discuss below a late nineteenth century description of the dialect once spoken in a single town. However, it will be clear in the ensuing chapters that other Wph communities exhibit a very different pattern. The variation involving dorsal fricatives referred to here can be observed throughout the Wph-speaking region over a time frame of approximately ninety years (1886–1974), after which the dialect has essentially become moribund.

The data discussed below have been drawn from the Wph dialect once spoken in the town of Soest ([zoːst]; Holthausen 1886; Figure 4.2).

The phonemic monophthongs consist of the front vowels /ɪ ɛː ɛ ʏ œː œ/ and the back vowels /ʊ ɔː ɔ ɑː ɑ ə/. Holthausen (1886: 7) lists a total of twenty-one diphthongs. Of those sounds, three have a second element that is front (/ui ɔe ɑe/), while eighteen have a second element that is back. The dorsal fricatives discussed below only occur in the context of six of the diphthongs ending in a back vowel (/iə iːə yə uə iu ɛo/).

Soest has four dorsal fricatives: [x ç] and [ɣ ʝ], whose relationship is expressed in (11a) for word-initial position and in (11b) for the context after a sonorant. In contrast to Altengamme, the dialect has no [g].

(11) a. /x/ → [x] [ç]; /ʝ/ → ʝ
b. /x/ → [x] [ç]; /ɣ/ → [ɣ]

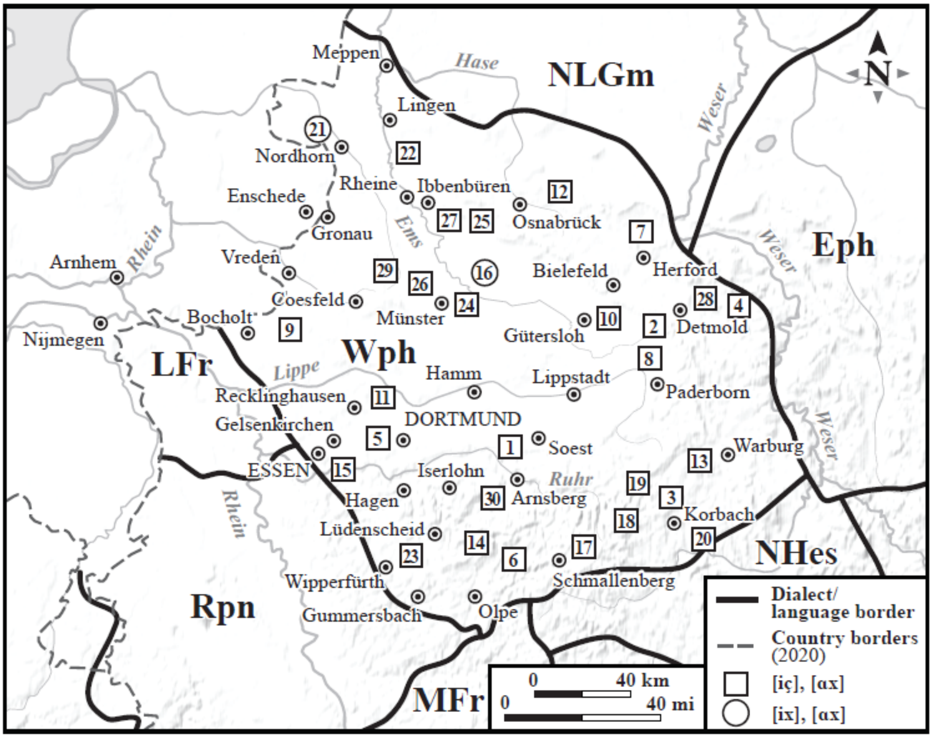
As indicated in (11), [ç] and [x] stand in complementary distribution both word-initially and after a sonorant. [ɣ] and [ʝ] likewise never contrast because the latter only occurs initially and the former only after a sonorant. Soest represents System B referred to in §4.1.

In word-initial position, [x] (=⟦x⟧) surfaces either before a back vowel (in 12a) or a sonorant consonant (in 12c), while [ç] (=⟦c⟧) occurs before a front vowel (in 12b). The sonorant consonant after [x] in (12c) is either a liquid ([l] or [ʀ]) or the nasal [n]. Holthausen (1886: 9) describes the rhotic consonant as a dorsal fricative (‘gutturaler Engelaut’). Word-initial [x] surfaces before a consonant regardless of the quality of the vowel following that consonant; in particular, that vowel can be either front (first example in 12c) or back (second two examples). There are a few gaps in the data set below (e.g. no [x] before [ɔː]), which I consider to be accidental. Word-initial [x] and [ç] in examples like these derived historically from WGmc $^{+}$[ɣ]; see Holthausen (1886: 44).[4]

(12) Distribution of word-initial [x] and [ç] (from /x/):

a.	xuət	[xuət]	gut	‘good’	88
	xòt	[xɔt]	geht	‘goes-3SG’	73
	xɑ	[xɑː]	gar	‘even’	42
	xɑst	[xɑst]	Gast	‘guest’	44
	xədult	[xədʊlt]	Geduld	‘patience’	15
b.	cist*a*n	[çɪstɐn]	gestern	‘yesterday’	44
	cymln	[çʏml̩n]	weinerlich sprechen	‘speak whiningly-INF’	44
	cèst	[çɛst]	Hefe	‘yeast’	43
	co̤*a*tə	[çœɐtə]	Grütze	‘groats’	44

[4] The MoStGm cognate verb (infinitive) for [xʀuinə] ‘cry-1SG’ in (12c) is *greinen* [gʀɑinən] ‘whine-INF’. The historical precursor for [xnɑːɣn̩] ‘gnaw-INF’ in (12c) is OSax *gnagan*.



Map 4.2: Westphalian (Wph). Squares indicate postsonorant velar fronting and circles no postsonorant velar fronting. 1=Holthausen (1886), 2=Hoffmann (1887), 3=Collitz (1899), 4=Böger (1906), 5=Beisenherz (1907), 6=Arens (1908), 7=Schwagmeyer (1908), 8=Brand (1914), 9=Herdemann (1921 [2006]), 10=Wix (1921), 11=Götze (1922) (Behringhausen), 12=Götze (1922) (Schinkel), 13=Martin (1925), 14=Gregory (1934), 15=Hellberg (1936), 16=Holtmann (1939), 17=Schulte (1941), 18=Martin (1942) (Willingen), 19=Martin (1942) (Sudeck), 20=Martin (1942) (Freienhagen), 21=Rakers (1944), 22=Borchert (1955), 23=Frebel (1957), 24=Keller (1961), 25=Bethge & Bonnin (1969) (Kreis Tecklenburg), 26=Seymour (1970), 27=Bethge (1970), 28=Stellmacher (1972), 29=Niebaum (1974), 30=Niebaum et al. (1976).

	cèŏs	[çɛɔs]	Gans	‘goose’	44
	cē̜an	[çɛːɐn]	gern	‘gladly’	44
	ciəntn	[çiəntn̩]	dort	‘there’	43
c.	xlykə	[xlʏkə]	Glück	‘fortune’	84
	xruĭnə	[xʀuinə]	weine	‘cry-1SG’	44
	xnɑʒn	[xnɑːɣn̩]	nagen	‘gnaw-INF’	44

The complementary distribution of word-initial [x] and [ç] also holds after a word-initial consonant (always [s]), as in (13): [x] surfaces before a back vowel (in 13a) or consonant (always [ʀ], in 13c) and [ç] before a front vowel (in 13b). The [sx sç] in these examples derived etymologically from WGmc ⁺[sk].

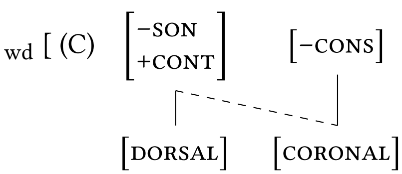
(13) Distribution of word-initial [sx] and [sç] (from /sx/):

a.	sxult	[sxʊlt]	Schuld	‘fault’	15
	sxɑ̜p	[sxɔːp]	Schaf	‘sheep’	43
b.	scylic	[sçʏlɪç]	schuldig	‘guilty’	43
	scèpm	[sçɛpm̩]	schöpfen	‘ladle-INF’	43
c.	sxruĭvə	[sxʀuivə]	schreibe	‘write-1SG’	43
	sxriʒn	[sxʀɪɣn̩]	schreien	‘scream-INF’	62

Holthausen’s discussion of inflectional morphology includes copious examples of regular Umlaut-induced alternations between [x] and [ç] in word-initial position, e.g. [xɑst] ‘guest’ vs. [çɛstə] ‘guests’ in which [x]/[ç] are the reflexes of WGmc ⁺[ɣ] and [sxɑp] ‘cabinet’ vs. [sçɛpə] ‘cabinets’, where [sx sç] are the reflexes of WGmc ⁺[sk].

[x] and [ç] in (12)-(13) are surface realizations of underlying /x/ in word-initial onset position. In that context, /x/ surfaces as [ç] by (14) and elsewhere (before a back vowel or /ʀ/) as [x]. Since there is no /ɣ/ in word-initial position that could potentially undergo (14) there is no reason to specify that its target be marked for a laryngeal feature.

(14) Wd-Initial Velar Fronting-3:



As indicated above, [coronal] spreads leftward from a front vowel. The feature [−consonantal] in the trigger ensures that /x/ fails to shift to [ç] before coronal consonants like [l] and [n] (cf. 12c).

The data below show that the etymological palatal (<WGmc $^{+}$[j]) surfaces in word-initial position before a back vowel (in 15a) or a front vowel (in 15b).[5] As noted earlier, the velar counterpart to [ɟ] (i.e. [ɣ]) never surfaces in word-initial position. [ɟ] in (15) is an underlying palatal (/ɟ/).

(15) Word-initial [ɟ] (from /ɟ/):

a.	jɑ̯	[ɟɔː]	ja	'yes'	43
	juŋk	[ɟʊŋk]	jung	'young'	43
b.	jiŭxn	[ɟiuxn̩]	jauchzen	'cheer-INF'	43

The data in (16) illustrate that [x] and [ç] do not contrast in postvocalic position: [x] surfaces after a back vowel in (16a) and [ç] after a front vowel in (16b). Holthausen (1886) also provides many examples exhibiting Umlaut-induced alternations between [x] and [ç], e.g. [dɔxtɐ] 'daughter' vs. [dœçtɐ] 'daughters'. In contrast to some of the dialects discussed above and below, /x/ does not occur after a consonant, although I consider that gap to be accidental. As indicated below, the dorsal fricatives in (16) are underlyingly /x/. The diachronic source for [x]/[ç] in (16a,b) is WGmc $^{+}$[x]. The additional examples in (16c) show that the diachronic source for /x/ can be a sound other than /x/. In particular, the [x ç] in those items derived historically from WGmc $^{+}$[f] by a change affecting LGm (x-Formation); cf. OSax *luft* 'air', MHG *niftel(e)* 'niece'. (x-Formation is an example of a change that increased the number of potential targets; recall Rule W from Table 2.7.

(16) Postvocalic [x] and [ç] (from /x/):

a.	sòxtə	[sɔxtə]	suchte	'searched-PRET'	44
	laxən	[lɑxən]	lachen	'laugh-INF'	44
b.	dyctic	[dʏçtɪç]	tüchtig	'capable'	44
	kröcn	[kʀœçn̩]	husten	'cough-INF'	44
	trèct*a*	[tʀɛçtɐ]	Trichter	'funnel'	14
	fröctn	[fʀœçtn̩]	fürchten	'fear-INF'	44
c.	luxt	[lʊxt]	Luft	'air'	44
	nicte	[nɪçtə]	Nichte	'niece'	44

[5] Example (15b) is rare because word-initial [ɟ] shifted to [ç] before a front vowel (Holthausen 1886: 43). Apparently the word [ɟiuxn̩] 'cheer-INF' was an exception to that change.

A series of sound changes ensured that [x]/[ç] occur after a short vowel and usually before [t] but not after a long vowel. First, historical ⁺[x] deleted in contexts other than before [t]; second, long front monophthongs shortened (and laxed) to [ɪ ʏ ɛ œ] before ⁺[x]; and third, ⁺[x] deleted in word-internal position before a vowel. As a result of those changes there are now no native words in Soest in which [ç] (or [x]) are situated in word-internal onset position.

As indicated in (17), velar [ɣ] (=⟦ʒ⟧) surfaces after a sonorant and before a syllabic nasal or vowel. As indicated in the second column, [ɣ] stands in a word-internal onset preceded by a back vowel (in 17a), front vowel (in 17b), or consonant (in 17c). It is shown below that underlying /ʀ/ can occur before /ɣ/, but that the former sound regularly vocalizes to [ɐ] in that position. The [ɣ] in (17) derives historically from one of several dorsal sounds (WGmc ⁺[ɣ gg j]); see Hall (2014b) for discussion.

(17) Postsonorant [ɣ] (from /ɣ/):

a.	vɑʒn	[vɑː.ɣn̩]	Wagen	'car'	45
	ròʒə	[ʀɔ.ɣə]	Roggen	'rye'	44
	rȩ*a*ʒn	[ʀeɐ.ɣn̩]	Regen	'rain'	44
	tīəʒn	[tiːə.ɣn̩]	gegen	'against'	44
b.	bryʒə	[bʀʏ.ɣə]	Brücke	'bridge'	44
	liʒə	[lɪ.ɣə]	liege	'lie-1sg'	44
	drèʒn	[dʀɛ.ɣn̩]	drehen	'turn-inf'	34
	ruĭʒə	[ʀui.ɣə]	Reihe	'row'	44
c.	bɑlʒə	[bɑl.ɣə]	Balge	'brat-dat sg'	44

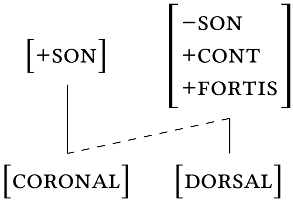
The items listed in (17b) are significant because they show that the palatal counterpart of [ɣ] (i.e. [ʝ]) does not occur even after a front vowel.[6]

The dorsal fricatives in (16) derive from /x/, which surfaces as [ç] after a front vowel by (18) and as [x] in the elsewhere case (after a back vowel). The examples in (17) show that the target for fronting cannot be the natural class of dorsal fricatives ([−sonorant, +continuant, dorsal]) because /ɣ/ is unaffected. As noted earlier, there are no examples in the original source in which /x/ occurs after a consonant. I assume that the trigger for fronting is [+sonorant], although it would alternatively be possible to posit that the trigger is [−consonantal], as in

[6] Since Soest has no surface [g], [ɣ]~[g] alternations motivating a synchronic rule of g-Spirantization (recall 8b) are absent; see Holthausen (1886: 43). The post-nasal [k] in words like [diŋk] 'thing' arguably derives from an underlying representation /diŋg/, whereby /g/ undergoes Final Fortition to [k]; recall the parallel examples from Altengamme in (4g).

Wd-Initial Velar Fronting-3 in (14). Since Velar Fronting-4 only affects /x/ but not /ɣ/, surface [ɣ] after front vowels as in (17b) does not exemplify opacity.

(18) Velar Fronting-4:



It was noted above that [x]/[ç] in (16) only occur after a short vowel. There is no reason to specify that the trigger in (18) be restricted to the context after a short vowel because there are no data in which /x/ is present after a long vowel

Soest has regular alternations between fortis and lenis fricatives (and fortis and lenis stops). Since fricatives are the focus of the present study, I only concentrate on those alternations here, e.g. [lius] 'louse' vs. [lui.zə] 'louses' for [s]~[z] and [slɑx] 'blow' vs. [sleɐ.ɣə] 'blows', [viːəx] 'weigh-imp sg' vs. [veɐ.ɣə] 'weigh-1sg' for [x]~[ɣ]. Those alternations require an underlying lenis sound (e.g. /z ɣ/) that surfaces as fortis in coda position by Final Fortition (in 8a); see Holthausen (1886: 75, 76). Morphemes with nonalternating fortis fricatives preclude analyzing [x]~[ɣ] alternations with a rule leniting underlying fortis sounds, e.g. [kʏ.sn̩] 'kiss-inf', [lɑ.xn̩] 'laugh-inf'.

The examples presented above show that postsonorant [x] has two synchronic sources: /x/ in words like the ones (16) and /ɣ/ in alternating words like [slɑx] 'blow' (cf. [sleɐ.ɣə] 'blows') mentioned in the preceding paragraph. The |x| derived from /ɣ/ regularly shifts to palatal [ç] in coda position after a front vowel, as in (19). Holthausen (1886) lists many strong verbs, nouns and adjectives like these exhibiting alternations along laryngeal and place dimensions (i.e. [ɣ]~[x]~[ç]).

(19) Place and laryngeal alternations (from /ɣ/):

a.	stuĭʒn	[stui.ɣn̩]	steigen	'climb-inf'	61
	sticst	[stɪçst]	steigst	'climb-2sg'	61
	stòěc	[stɔeç]	stieg	'climbed-pret'	61
b.	flaěʒn	[flɑe.ɣn̩]	fliegen	'fly-inf'	63
	flycst	[flʏçst]	fliegst	'fly-sg'	63
	flèŏx	[flɛox]	flog	'flew-pret'	63

Final Fortition and Velar Fronting-4 together produce transparent outputs. The /ɣ/ in (19) surfaces as [ɣ] in onset position, e.g. [stui.ɣn̩] 'climb-inf' and [flɑe.ɣn̩] 'fly-INF'. In the coda, /ɣ/ shifts to |x|, which surfaces as [x] after a back vowel (e.g. [flɛɔx] 'flew-PRET') and as [ç] after a front vowel via Velar Fronting-4 (Vel Fr-4). Final Fortition therefore creates a new |x| which forms the input to Velar Fronting-4, as in (20a) for /stɪɣ-st/ 'climb-2SG' (from 19a). The word /fʀœxt-n̩/ 'fear-INF' (from 16bb is a representative example of /x/ after a front vowel for comparison. The relationship between Final Fortition and Velar Fronting-4 is a feeding one, cf. (20a). The reverse ordering in (20b) shows that Final Fortition cannot counterfeed Velar Fronting-4. See also §5.2, in which I discuss a different Wph variety in which the counterfeeding relationship between the two rules in question is correct.

(20)	a.		/stɪɣ-st/	/fʀœxt-n̩/
		Fnl For	stɪx-st	—
		Vel Fr-4	stɪçst	fʀœçtn̩
			[stɪçst]	[fʀœçtn̩]
			'climb-2SG'	'fear-INF'
	b.		/stɪɣ-st/	/fʀœxt-n̩/
		Vel Fr-4	—	fʀœçtn̩
		Fnl For	stɪx-st	—
			*[stɪxst]	[fʀœçtn̩]

The feeding relationship depicted in (20a) is a specific example of the hypothetical Dialect A from Figure 2.5.

As in Ramsau am Dachstein (§3.5), Soest has many alternations involving the consonantal rhotic (dorsal [ʀ]) and the vocalized-r ([ɐ]). A discussion of the realization of [ʀ] in the coda can be found in Holthausen (1886: 42).[7]

(21) [ʀ]~[ɐ] alternations (from /ʀ/):

a.	ę̄rə	[ɛːʀə]	ihre	'her-INFL'	25
	ę̄*a*	[ɛːɐ]	ihr	'her'	25
b.	hœ̄rə	[hœːʀə]	höre	'hear-1SG'	28
	hœ̄*a*st	[hœːɐst]	hörst	'hear-2SG'	28
c.	tę̄rə	[tɛːʀə]	zehre	'feed on-1SG'	74
	tę̄*a*st	[tɛːɐst]	zehrst	'feed on-2SG'	74

[7]Note the similarity between Holthausen's symbol for the vocalized-r (⟦*a*⟧) and his symbol for the short low back vowel (i.e. ⟦ɑ⟧). The discussion of the phonetics of vowels in that source indicates that the two vowels in question are distinct (Holthausen 1886: 7). I transcribe Holthausen's vocalized-r henceforth as [ɐ].

The data in (22) illustrate that /ɣ/ surfaces as velar ([x]) in coda position after [ɐ]:

(22) Velar [x] (from /x/) after [ɐ] (from /ʀ/):

bę̄*ax*	[bɛːɐx]	Berg	'mountain'	44
tvę̄*ax*	[tvɛːɐx]	Zwerg	'dwarf'	24
bǫ*ax*	[boːɐx]	Borg	'barrow'	44

Soest /ʀ/ surfaces as [ɐ] in coda position by r-Vocalization in (23) and elsewhere (in the onset) as [ʀ]. Example (17c) indicates that Soest does not vocalize coda /l/ as Ramsau am Dachstein.

(23) r-Vocalization:

$$\begin{bmatrix} +\textsc{cons} \\ +\textsc{son} \\ -\textsc{nasal} \\ \textsc{dorsal} \end{bmatrix} \rightarrow [-\text{cons}]\ /\ \underline{\quad}\ C_0\ ]_\sigma$$

r-Vocalization only alters the feature [±consonantal]; hence, the derived sound [ɐ] – like the input /ʀ/ – is also [dorsal]. Since [ɐ] is phonologically [dorsal] the occurrence of [x] after that sound is precisely what one would expect in a dialect where [x] and [ç] have a transparent distribution.

The significant point concerning the history of dorsal fricatives in Soest is that sound changes converting original front sounds to back sounds (Vowel Retraction) or the reverse (Vowel Fronting) had no effect on the distribution of velar and palatal allophones in the neighborhood of those front/back sounds. I consider first word-initial position and then the context after a sonorant.

In the dialect of Soest as it was described in 1886, word-initial [x]/[ç] developed out of WGmc ⁺[ɣ] and word-initial [sx]/[sç] from WGmc ⁺[sk]. Palatal [ç] occurs before front vowels that were historically front (=24d) and before front vowels that were etymologically back (=24c,f). The surface velar [x] likewise occurs before etymological back vowels (=24a,e) and before vowels that were originally front (=24b). The reconstructed forms to the right of the wedge are my own; the forms in the third column represent Stage 1. It is assumed that WGmc ⁺[ɣ] and WGmc ⁺[sk] had already changed to [x] (/x/) and [sx] (/sx/) respectively. The second column represents the point where velar fronting (=Wd-Initial Velar Fronting-3) was phonologized but before certain front vowels had changed to schwa (in 24b).

(24) a. [xɑst] < ⁺[xɑst] < ⁺[xɑst] 'guest' cf. OSax *gast* (from 12a)

b. [xədʊlt] < +[çidʊlt] < +[xidʊlt] 'patience' cf. OSax *githuld* (from 12a)
c. [çɛɔs] < +[çɛɔns] < +[xɛɔns] 'goose' cf. MLG *gōs* (from 12b)
d. [çɪstɐn] < +[çɪstɐn] < +[xɪstɐn] 'yesterday' cf. MLG *gisteren* (from 12b)
e. [sxʊlt] < +[sxʊlt] < +[sxʊlt] 'fault' cf. OSax *skuld* (from 13a)
f. [sçʏlɪç] < +[sçʏldɪç] < +[sxʏldɪç] 'guilty' (from 13b)

The two historical changes that introduced /x/ into word-initial onsets are stated in (25a,b). Wd-Initial ɣ-Fortition and k-Spirantization were general sound changes affecting many LGm varieties. The vocalic modifications in (24) exemplifying Vowel Fronting include i-Umlaut (in 24f) and a change specific to LGm (in 24c), i.e. /ɑ/ > /ɛɔ/. Note that the latter change is classified as Vowel Fronting because the part of the new diphthong that is front (/ɛ/) is the one adjacent to the dorsal fricative. Vowel Fronting in word-initial position is depicted in (2b). The change whereby unstressed full vowels surfaced as schwa (in 24b) is presented in (25c); recall §2.4.3. If the original vowel is front (as in 24b) then Vowel Reduction can be classified as a particular type of Vowel Retraction. Vowel Reduction is a major sound change that affected virtually all LGm and HGm dialects.

(25) a. Wd-Initial ɣ-Fortition:
ɣ/ > /x/ $_{\text{wd}}$[____
b. k-Spirantization:
/k/ > /x/ $_{\text{wd}}$[s ____
c. Vowel Reduction:
/{ unstressed vowel }/ > /ə/

In (26) I give historical derivations for three examples from (24). At Stage 1 Velar fronting has not yet been phonologized, but Wd-Initial ɣ-Fortition and k-Spirantization had already introduced new instances of [x] (/x/). Stage 2 represents the dialect as it was described by Ferdinand Holthausen in 1886. The intermediate stage ("Pre-Soest") corresponds to the second column in (24): This is the point after Wd-Initial Velar Fronting-3 had been phonologized but before Vowel Reduction had restructured unstressed full vowels to schwa.

(26)

/xɑst/	/xidʊlt/	/xɪstɐn/	
[xɑst]	[xidʊlt]	[xɪstɐn]	Stage 1
/xɑst/	/xidʊlt/	/xɪstɐn/	
[xɑst]	[çidʊlt]	[çɪstɐn]	Pre-Soest
/xɑst/	/xədʊlt/	/xɪstɐn/	
[xɑst]	[xədʊlt]	[çɪstɐn]	Stage 2
Gast	*Geduld*	*gestern*	MoStGm
'guest'	'patience'	'yesterday'	

The word [xədʊlt] requires comment. The initial fricative in that type of example was a surface palatal at the Pre-Soest stage, prior to Vowel Reduction. That stage ([çidʊlt]) is not attested in any modern German dialect, although the material presented in the LGm dialects discussed in Chapter 7 and Chapter 8 makes it clear that there must have been that earlier stage (cf. OSax *giduld*). Since the vowel following /x/ in [xədʊlt] is schwa, the fricative /x/ cannot front to palatal and therefore surfaces as [x]. The change from a Pre-Soest sequence like /xi/ to Stage 2 /xə/ involved Vowel Reduction, which deleted the feature [coronal] from the front vowel (/i/). The significance of that development is discussed in Chapters 7 and 8 where it is shown that there are other German dialects in which the initial sound surfaces as palatal [ç] before schwa.

The reflexes of WGmc $^{+}$[ɣ] in postsonorant position are given for three representative words in (27). The reconstructions are my own.

(27)

a.	[stui.ɣn̩]	<	$^{+}$[stiɣɑn]	'climb-INF'	cf. OSax *stīgan*	(from 19a)
b.	[stɪçst]	<	$^{+}$[stiɣst]	'climb-2SG'		(from 19a)
c.	[bɛːɐx]	<	$^{+}$[berɣ]	'mountain'	cf. OSax *berg*	(from 22)

Example (27c) deserves comment. As in Ramsau am Dachstein (§3.5), the [dorsal] rhotic derived historically from the corresponding [coronal]. Evidence for that assumption is that the [coronal] sound is retained as [r] (/r/) in many closely related LGm dialects discussed throughout this book. My treatment in (27c) is also consistent with the description of the rhotic consonant in the original source, where Holthausen (1886: 43) observes that the original realization ([r]) is retained in the villages surrounding Soest. Given the earlier stage with [r] (/r/), r-Retraction (§3.5) must restructured the [coronal] rhotic in Soest to the [dorsal] rhotic.

The three examples from (27) are illustrated in (28). Stage 2B is the Soest dialect of 1886. Recall from (20) that both Velar Fronting-4 and Final Fortition are present.

It is assumed here that Final Fortition was already active at Stage 1; see §5.5.2 for discussion.

(28)	/stuiɣ-n/	stɪɣ-st/	/bɛːrɣ/	
	[stui.ɣn̩]	[stɪxst]	[bɛːrx]	Stage 1
	/stuiɣ-n/	stɪɣ-st/	/bɛːrɣ/	
	[stui.ɣn̩]	[stɪçst]	[bɛːrç]	Stage 2A
	/stuiɣ-n/	stɪɣ-st/	/bɛːʀɣ/	
	[stui.ɣn̩]	[stɪçst]	[bɛːɐx]	Stage 2B
	steigen	*steigst*	*Berg*	MoStGm
	'climb-INF'	'climb-2SG'	'mountain'	

Stage 2A represents the point where Velar Fronting-4 and Final Fortition were first active together in the synchronic phonology. Crucially, the rhotic in words like [bɛːrç] 'mountain' was still coronal. Since the set of triggers for Velar Fronting-4 includes all coronal sonorants, the dorsal fricative in words like [bɛːrç] surfaced as palatal at Stage 2A. Evidence for Stage 2A comes from dialects spoken roughly at the same time as the one Holthausen (1886) describes in Soest where the [rç] sequence is preserved, cf. [bɑrç] 'mountain' in Dorste in (34a) below.

Stage 2B (=Soest in 1886) represents the point where r-Retraction restructured /r/ to /ʀ/. The change from /r/ to /ʀ/ is a specific example of retraction in (1a): In the first column, the feature [coronal] is linked to both sounds (e.g. [r] and [ç]) as a consequence of Velar Fronting-4. When /r/ restructured to /ʀ/ by r-Retraction [coronal] was replaced with [dorsal], as illustrated to the right of the wedge in (1a). The consequence of that change is that the surface palatal [ç] depicted before the wedge reverted back to [x] (after the wedge).

Each variety of Wph needs to be assessed individually because there are few generalizations concerning the patterning of dorsal fricatives that hold for that entire branch of WLGm. One might conclude that there is nothing at all unusual about the transparent patterning of dorsal fricatives in Soest, but this impression is not correct when one compares the Soest system with other Wph (and Eph) ones. The conclusion is that the system of velar and palatal fricatives in Soest is more the exception than the rule.

Soest has processes fronting velars in word-initial position and after a sonorant. However, some Wph varieties are attested with no velar fronting in word-initial position; hence, /x/ (<WGmc $^{+}$[ɣ] or after initial $^{+}$[s]) surfaces as [x] even before front vowels, e.g. Gütersloh (Wix 1921; Figure 4.2). In Wph varieties with

either word-initial or postsonorant velar fronting the targets and triggers for those processes are not necessarily the same as the targets and triggers for the same processes in Soest. In word-initial onset position Soest /x/ surfaces as [ç] before a narrow set of sounds (front vowels but not before coronal consonants). That pattern is essentially the same in Laer (Niebaum 1974; Figure 4.2), but in Elspe (Arens 1908; Figure 4.2) the set of triggers is broader (all coronal sonorants). For postsonorant position the sole target for fronting in Soest is /x/ (but not /ɣ/). That narrow set of targets is attested in other varieties of Wph, e.g. Adorf (Collitz 1899; Figure 4.2) and Laer (Niebaum 1974; Figure 4.2). The same point holds for Eph, e.g. Meinersen (Bierwirth 1890; Figure 4.3) and Börßum (Heibey 1891; Figure 4.3), as well as several varieties of WCGm (§12.3.4). That pattern can be contrasted with other varieties with a broader set of targets (i.e. /x/ and /ɣ/; §4.4).

The patterning of [x]/[ç] from /x/ is allophonic in Soest, but that type of system can be contrasted with ones in which [ç] has been quasi-phonemicized to /ç/, e.g. Elspe (Arens 1908; Figure 4.2) and Schieder-Schwalenberg (Böger 1906; Figure 4.2). Examples like these are discussed in detail in Chapter 7.

4.4 Eastphalian

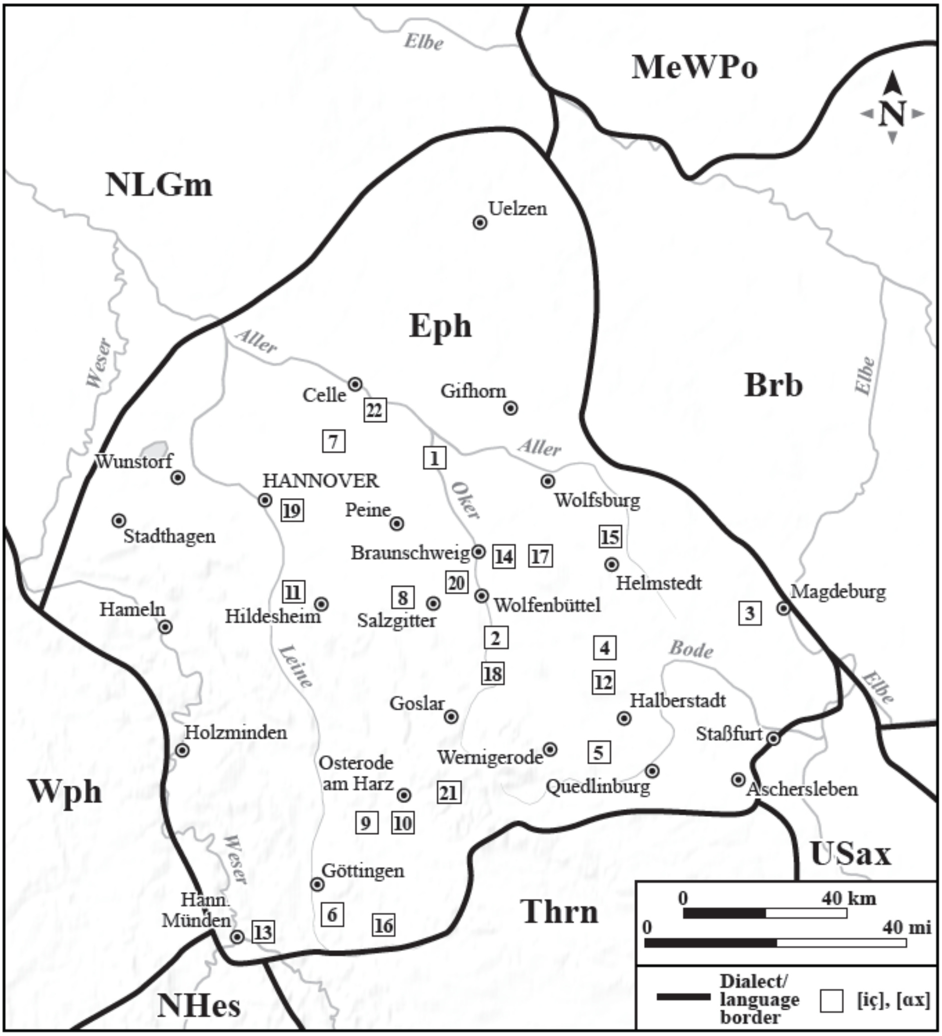
The present section investigates the complementary distribution of velar fricatives ([x ɣ]) with the corresponding palatals ([ç ʝ]) in an Eph variety. The significance of this case study is that the target segments for postsonorant fronting consist of both /x/ and /ɣ/ and not just /x/, as in Soest (System C referred to in §4.1).

The data discussed below are drawn from the Eph dialect once spoken in and around the town of Dorste (Dahlberg 1934, 1937, 1934; Figure 4.2). See also Mackel's (1939) phonetic transcriptions of a speaker from Dorste (Osterode am Harz). map

The phonemic monophthongs consist of the front vowels /iː ɪ yː ʏ eː ɛː ɛ œ/ and the back vowels /uː ʊ ɔ ɑ ə/. I omit Dahlberg's ⟦œ̄⟧ because no example was found in that source with a dorsal fricative in the neighborhood of that vowel. Of the twelve diphthongs listed in the original source I only consider the eight which occur in the context of dorsal fricatives. Those diphthongs end in a front vowel (/ʊɪ ɔɪ ɑɪ/) or back vowel (/iːə uːə eːə ɛʊ ɑʊ/).

Dorste possesses the four dorsal fricatives [x ç ɣ ʝ], whose relationship is depicted word-initially (29a) and after a sonorant in (29b). There are no contrasts between velar and the corresponding palatal.

(29)



Map 4.3: Eastphalian (Eph). Squares indicate postsonorant velar fronting. 1=Bierwirth (1890), 2=Heibey (1891), 3=Roloff (1902), 4=Block (1910), 5=Damköhler (1919), 6=Jungandreas (1926), Jungandreas (1927), 7=Jarfe (1929). 8= Löfstedt (1933), 9=Dahlberg (1934), Dahlberg (1937), 10=Mackel (1939) (Osterode am Harz), 11=Mackel (1939) (Hildesheim), 12=Hille (1939), 13=Hassel (1942), 14=Pahl (1943), 15=Brugge (1944), 16=Schütze (1953), 17=Bethge & Flechsig (1958), 18=Lange (1963), 19=Bethge & Bonnin (1969), 20=Bethge & Bonnin (1969), 21=Göschel (1973), 22=ACeM.

a.	/x/		/ʝ/		b.	/x/		/ɣ/	
	[x]	[ç]	[ʝ]			[x]	[ç]	[ɣ]	[ʝ]

The word-initial pattern in (29a) is the same as in Soest. The difference between Soest and Dorste is in postsonorant position, as indicated in (29b), cf. (11b)

Word-initial [x] (=⟦x⟧) surfaces either before a back vowel (in 30a) or a sonorant consonant (in 30c) and [ç] (=⟦χ⟧) before a front vowel (in 30c); see Dahlberg (1937: 15). The coronal sonorant consonant after [x] in (30c) is either a liquid ([l]/[r]) or nasal [n]. [r] is coronal because it is articulated with the tongue tip ("Zungenspitzen-r": Dahlberg 1937: 5). Word-initial [x] surfaces before a consonant regardless of the quality of the vowel following that consonant; in particular, it can be either front (as in the final example in 30c) or back (as in the first two examples). Word-initial [x ç] in (30) derived historically from WGmc $^{+}$[ɣ] by Wd-Initial ɣ-Fortition (in 25a).[8]

(30) Distribution of word-initial [x] and [ç] (from /x/):

a.	xūətə	[xu:ətə]	Gosse	'gutter'	73
	xụnst	[xʊnst]	Gunst	'favor'	73
	xọt	[xɔt]	Gott	'God'	15
	xạl	[xɑ:l]	geil	'cool'	73
	xast	[xɑst]	Gast	'guest'	73
	xaịst	[xɑɪst]	Geist	'intellect'	72
	xaụt	[xɑʊt]	gut	'good'	15
b.	χījn̥	[çi:ʝn̩]	gegen	'against'	15
	χịstə(r)n	[çɪstə(r)n]	gestern	'yesterday'	74
	χụ̈stə	[çʏstə]	keine Milch gebend	'not giving-PART milk'	74
	χẹ̄və	[çɛ:və]	gäbe	'give-SUBJ'	74
	χẹlt	[çɛlt]	Geld	'money'	73
	χọ̈rtl̥	[çœrtl̩]	Gürtel	'belt'	74
	χēərn	[çe:ərn]	gern	'gladly'	74
	χẹ̈ụs	[çɛʊs]	Gans	'goose'	73

[8] In contrast to Soest, there are no words containing [x] or [ç] after a word-initial sibilant (recall 13). The corresponding examples in Dorste are realized as [ʃ] (/ʃ/), e.g. [ʃɑ:f] 'sheep' (cf. Soest [sxɔ:p]). Dahlberg's ⟦ẹ̄⟧ is described as a vowel corresponding to MoStGm *spät* 'late' (Dahlberg 1934: 13) and is therefore transcribed as [ɛ:]. His ⟦ɛ⟧ expresses a vowel quality between [e:] (=⟦ē⟧) and [ɛ:] (=⟦ẹ̄⟧). I transcribe ⟦ɛ⟧ below as [ɛ:] because my treatment does not hinge on the fine-grained vowel qualities described in the original source. For the same reason, I transcribe Dahlberg's ⟦ẹ⟧ and ⟦ẹ̈⟧ both as [ɛ].

	χīən	[çiːən]	jäten	'weed-INF'	74
c.	xlɑs	[xlɑs]	Glas	'glass'	15
	xrɑs	[xrɑs]	Gras	'grass'	15
	xnę̈u̯ʒn̥	[xnɛʊɣn̩]	nagen	'gnaw-INF'	73

Dahlberg (1937) gives many morphemes with [x]~[ç] alternations triggered by Umlaut, e.g. [xɑst] 'guest' vs. [çɛstə] 'guests'. The two sounds [x] and [ç] in those alternating examples and in (30) are surface realizations of the phoneme /x/, which surfaces as [ç] in word-initial position if the following segment is a front vowel (by Wd-Initial Velar Fronting-3 from 14).

The etymological palatal ([ɟ] < WGmc ⁺[j]) surfaces in word-initial position before a back vowel (in 31a) or front vowel (in 31b). The velar counterpart to [ɟ] (i.e. [ɣ]) never occurs in word-initial position.[9]

(31) Word-initial [ɟ] (from /ɟ/):

a.	jụŋə	[ɟʊŋə]	Junge	'boy'	76
	jɑmə(r)	[ɟɑmə(r)ə]	Jammer	'lament'	76
b.	jü̩kn̥	[ɟʏkn̩]	jucken	'itch-INF'	76
	jö̩k	[ɟœk]	euch	'you-ACC/DAT PL'	76

In postsonorant position [x] and [ç] stand in an allophonic relationship: [x] surfaces after a back vowel (in 32a) and [ç] after a front vowel (in 32b) or a coronal sonorant consonant (in 32c). The nonoccurrence of [x ç] after phonemic vowels other than the ones listed below or after /l n/ is accidental. Due to Umlaut-induced vowel changes there are many [x]~[ç] alternations, e.g. [hɛʊx] 'high' vs. [hœçst] 'highest'. [x ç] in alternating examples like these and [x ç] in (32) derive synchronically from /x/ by Velar Fronting-1. Historically the dorsal fricatives in (32a-c) derive from WGmc ⁺[x]. As in Soest (=16c), /x/ can also derive historically from /f/ by x-Formation (in 32d).

(32) Postsonorant [x] and [ç] (from /x/):

a.	dọx	[dɔx]	doch	'however'	15
	ɑxt	[ɑxt]	acht	'eight'	64

[9] [ɟ] (/ɟ/) also derived historically from WGmc ⁺[ɣ] in word-initial position before schwa, e.g. [ɟəvɑlt] 'violence' (=⟦ɟəvɑlt⟧), cf. OSax *giwald*. The [ɟ] (/ɟ/) in that type of example is a palatal quasi-phoneme, which is discussed in other German dialects detail in Chapter 7. No Eph dialect in the present study is completely free from opacity, although the one opaque palatal in Dorste is extremely limited in its occurrence. Note that the corresponding examples in Soest have a velar ([x]), e.g. [xədʊlt] 'patience' in (12a); cf. OSax *giduld*.

b.	bi̯χtə	[bɪçtə]	Beichte	'confession'	16
	lü̯χtn̥	[lʏçtn̩]	leuchten	'glow-INF'	80
	fu̯i̯χt	[fʊɪçt]	feucht	'damp'	72
c.	fo̞rχt	[fɔrçt]	Furcht	'fear'	71
d.	lu̯xt	[lʊxt]	Luft	'air'	16
	e̞χt	[ɛçt]	echt	'genuine'	16

Recall from the discussion after (16) that there are historical reasons for why the dorsal fricatives in LGm items like these only occur after a short vowel (typically followed by [t]).

[ɣ] (=⟦ʒ⟧) and [ʝ] (=⟦j⟧) have a distribution that parallels the one involving [x] and [ç] (see 29b). As indicated in (33), velar [ɣ] surfaces in a word-internal onset after a back vowel (in 33a) and palatal [ʝ] in a word-internal onset after a front vowel (in 33b) or coronal sonorant consonant (in 33c). In the overwhelming majority of examples like these [ɣ ʝ] are the reflexes of WGmc ⁺[ɣ]. As noted below, [ɣ ʝ] in (33) derive synchronically from velar /ɣ/.[10]

(33) Postsonorant [ɣ] and [ʝ] (from /ɣ/):

a.	būʒn̥	[buː.ɣn̩]	Bogen	'bow'	16
	ë̞u̯ʒə	[ɛʊ.ɣə]	Auge	'eye'	70
b.	hījn̥	[hiː.ʝn̩]	hegen	'foster-INF'	75
	bǖjl̥	[byː.ʝl̩]	Bügel	'clamp'	68
	fɛjn̥	[fɛː.ʝn̩]	fegen	'sweep-INF'	75
	drē̞jn̥	[drɛː.ʝn̩]	drehen	'turn-INF'	69
	mo̞i̯jətə	[mɔɪ.ʝətə]	Mägde	'maidservants'	15
	dru̯i̯jə	[drʊɪ.ʝə]	trocken	'dry'	69
	flai̯jə	[flaɪ.ʝə]	Fliege	'fly'	71
c.	fe̞ljə	[fɛl.ʝə]	Felge	'wheel rim'	16
	mo̞rjə	[mɔr.ʝə]	morgen	'tomorrow'	81

In postsonorant position palatals occur only after coronal sonorants and velars after back vowels; hence, there are no contrastive sequences like [ix] vs. [ɑç] (or [iɣ] vs. [ɑʝ] before a vowel).

The examples in (33) illustrate an important difference between Dorste and Soest: In the latter dialect, [ɣ] – but not [ʝ] – surfaces in word-internal onset

[10] The fricative in words like [drɛː.ʝn̩] 'turn-INF' in (33b) is the reflex of WGmc ⁺[j]. That glide shifted to velar /ɣ/ after a front vowel by a regular change that affected LGm dialects (Hall 2014b). Recall from (17b) that the /ɣ/ in question is preserved as [ɣ] in Soest (e.g. [dʀɛ.ɣn̩] 'turn-INF').

position after back vowels, front vowels and liquids (recall 17). By contrast, in Dorste the two fricatives [ɣ] and [ʝ] – like [x] and [ç] – stand in complementary distribution in postsonorant position. Thus, the set of targets for postsonorant fronting consists of /x/ but not /ɣ/ in Soest, but in Dorste it consists of /x/ and /ɣ/. The different targets are captured formally with two different fronting processes: Velar Fronting-4 for Soest and Velar Fronting-1 for Dorste.

The examples in (34) exhibit an alternation involving laryngeal features (in 34a,b) and both place and laryngeal features (in 34c,d); see Dahlberg (1937: 34).

(34) Place and laryngeal alternations (from /ɣ/):

a.	bɑrχ	[bɑrç]	Berg	'mountain'	65
	bɑrjə	[bɑrʝə]	Berge	'mountains'	16
b.	vęχ	[vɛç]	Weg	'path'	34
	vęjə	[vɛʝə]	Wege	'paths'	34
c.	slɑx	[slɑx]	Schlag	'blow'	34
	slę̈u̯ʒ̨əs	[slɛʊɣəs]	Schlages	'blow-GEN SG'	34
	slɛjə	[slɛːʝə]	Schläge	'blows'	34
d.	dǖjn̥	[dyːʝn̩]	taugen	'be good for sth-INF'	32
	dǖjə	[dyːʝə]	tauge	'id.-1SG'	32
	dǫ̈χst	[dœçst]	taugst	'id.-2SG'	32
	dǫxtə	[dɔxtə]	taugte	'id.-PRET'	32

The fortis vs. lenis alternations in (34) are accounted for with Final Fortition (from 8a) and the surface palatals with Velar Fronting-1. As shown below, the outputs are transparent because the two rules in question are unordered (cf. Altengamme in 9). The word [vɛç] 'path' (from 34b) is representative of words ending in a front vowel followed by /ɣ/. The word [ɛçt] 'genuine' (from 32d) illustrates the behavior of /x/ after a front vowel for comparison.

(35)

a.		/vɛɣ/	/ɛxt/	b.		/vɛɣ/	/ɛxt/
	Fnl For	vɛx	––		Vel Fr-1	vɛʝ	ɛçt
	Vel Fr-1	vɛç	ɛçt		Fnl For	vɛç	––
		[vɛç]	[ɛçt]			[vɛç]	[ɛçt]
		'path'	'genuine'				

The relationship between Velar Fronting-1 and Final Fortition in (35) can be compared with the ones in (20) for Soest, in which Final Fortition feeds Velar Fronting-4.

As in all of the other German dialects discussed above, velars fronted to palatal in Dorste regardless of the etymological source of the segments serving as triggers. Thus, palatals surface in the neighborhood of front vowels that were etymologically front (in 36a and 37a) or back (in 36b and 37b) and velars in the neighborhood of back vowels that were etymologically back (in 36c and 37c) or front (in 36d). Examples (36b) and (37b) illustrate dialect-specific examples of Vowel Fronting and example (36d) of Vowel Retraction; no parallel example was found for Vowel Retraction in the postsonorant context. Note that the change from back monophthong to a diphthong in (36b) and (37b) is classified as Vowel Fronting on the basis of the location of the front vowel component of that diphthong. Hence, [oː] > [ɛʊ] involves Vowel Fronting because the [ɛ] component is adjacent to the dorsal fricative, but [o] > [ʊɪ] is likewise Vowel Fronting because the front component [ɪ] is adjacent to the dorsal fricative. The changes involving Vowel Retraction and Vowel Fronting in Dorste are depicted in (1) and (2) respectively. The reconstructed examples in the second column below are my own.

(36)	a.	[çɛlt]	<	⁺[xɛld]	'money'	cf. OSax *geld*	(from 30b)
	b.	[çɛʊs]	<	⁺[xoːs]	'goose'	cf. MLG *gōs*	(from 30b)
	c.	[xɑst]	<	⁺[xɑst]	'guest'	cf. OSax *gast*	(from 30a)
	d.	[xɑːl]	<	⁺[xeːl]	'cool'	cf. OSax *gēl*	(from 30a)
(37)	a.	[fɛːʝn̩]	<	⁺[fɛːɣn̩]	'sweep-INF'	cf. OSax *fegon*	(from 33b)
	b.	[drʊɪʝə]	<	⁺[droɣə]	'dry'	cf. MLG *droge*	(from 33b)
	c.	[ɛʊɣə]	<	⁺[ɛʊɣə]	'eye'	cf. OSax *ōga*	(from 33a)

The broad set of targets for postsonorant fronting (/x ɣ/) and the full range of triggers for that change (coronal sonorants) were exemplified above for Dorste. The same pattern is reflected in other Eph varieties, e.g. Magdeburger Börde (Roloff 1902; Figure 4.3), Eilsdorf (Block 1910; Figure 4.3), Emmerstedt (Brugge 1944; Figure 4.3), and Göddeckenrode/Isingerode (Lange 1963; Figure 4.3). However, as noted in §4.2, there are Eph-speaking communities like Meinersen and Börßum were described at the end of the nineteenth century with the narrow set of targets for postsonorant velar fronting (/x/), as in Soest.

The synchronic fronting of word-initial /x/ to [ç] as described above for Dorste is not a general feature of Eph because Wd-Initial ɣ-Fortition (in 25a) did not affect that entire dialect region. Instead, WGmc ⁺[ɣ] underwent either g-Formation-1 (in 10b) or a more specific change from /ɣ/ to /g/ in word-initial position only.

The realization of /x/ as [x] or [ç] after a word-initial [s] as in Soest (=13) is attested neither in Dorste, nor in other varieties of Eph, where the realization is [ʃ], as in MoStGm; see Hall (2021) for extensive discussion.

Velar fricatives are in complementary distribution with the corresponding palatals in Dorste, but other varieties of Eph are attested in which velar vs. palatal contrasts occur in word-initial position. According to one pattern, WGmc +[ɣ] is realized as [ɣ] in word-initial position before back vowels. Since Glide Hardening (in 10a) ensured that word-initial +[j] is realized as [ʝ] (/ʝ/) before any vowel, that type of dialect now has contrasts between velars ([ɣ] /ɣ/) and palatals ([ʝ] /ʝ/) in word-initial position before back vowels (e.g. Block 1910; Figure 4.3). Examples like these are discussed in Chapter 8.

4.5 Discussion

The material investigated in this chapter and in Chapter 3 reveals variation involving targets and triggers for velar fronting. In §4.5.1 I summarize the synchronic facts discussed up to this point and consider briefly how they are accommodated in the rule generalization model (§2.4.1). In all of the case studies discussed up to this point palatal [ç] is the derived allophone of /x/ occurring in the context of a front segment, but the word-initial etymological palatal [ʝ] (/ʝ/) occurs before front and back vowels. In §4.5.2 I discuss the phonological motivation for the emergence of those underlying palatals.

4.5.1 Interim assessment of targets, triggers, and rule generalization

The various versions of velar fronting posited above do not have a consistent set of targets and/or triggers. For example, the target for postsonorant fronting consists solely of /x/ in Soest but of /x ɣ/ in Dorste. The triggers for the fronting /x/ in word-initial position in Soest and Dorste is the set of front vowels, but in another Wph variety alluded to earlier (Elspe; Arens 1908) the fronting of word-initial /x/ is induced by all coronal sonorants. Postsonorant velar fronting in Rheintal (§3.4) occurs in the context of nonlow front vowels or coronal sonorant consonants, but the set of triggers for the same process in a number of other varieties discussed above consists of all coronal sonorants.

In this book I apply rule generalization to velar fronting in German dialects. When that process was first phonologized the change was triggered by a highly restricted set of front segments, and the target segment was likewise restricted to a single velar; recall Figure 2.3 and Figure 2.4. In terms of time, the set of triggers expanded to include more and more front sounds, while the set of targets analogously increased to include a greater number of velars. In terms of space, velar fronting spread outwards from the focal areas; when this occurred, the process had the narrow set of targets and triggers. Recall how rule generalization was depicted abstractly in Figure 2.1.

A preliminary list of changes from specific to general targets/triggers is given in (38). HFV=high front vowels, MFV=mid front vowels, LFV=low front vowels, and CC=coronal sonorant consonants

(38) Changes in targets (in a) and triggers (in b):

a. /x/ > /x ɣ/ > /x ɣ k g ŋ/

b. $\{\text{HFV}\} > \left\{\begin{matrix}\text{FHV}\\ \text{MFV}\end{matrix}\right\} > \left\{\begin{matrix}\text{HFV}\\ \text{MFV}\\ \text{CC}\end{matrix}\right\} > \left\{\begin{matrix}\text{HFV}\\ \text{MFV}\\ \text{LFV}\\ \text{CC}\end{matrix}\right\}$

Synchronic evidence for the historical stages depicted in (38) comes in the form of dialects described in late nineteenth century up to the present representing those stages. For example, postsonorant velar fronting in Soest exemplifies the /x/ stage and Dorste the /x ɣ/ stage. In terms of time, the original set of targets expanded from pre-Dorste (/x/ only) to Dorste (/x/ and /ɣ/). Dialects with the largest set of targets (/x ɣ k g ŋ/) are discussed in Chapter 11.

That /ɣ/ was not an original target follows from the Implicational Universal for Velar Fronting Targets-2 (§2.3.2): "If a lenis sound undergoes velar fronting then the corresponding fortis sound does as well". Given that exceptionless generalization, /ɣ/ cannot be the target segment unless /x/ is.

The set of triggers for velar fronting at the point when the process was first phonologized likewise consisted of a small number of sounds most conducive to fronting and then gradually expanded to include a larger number of sounds; see (38b). The final stage in (38b) represents the default set of triggers (all coronal sonorants), which can be observed in several varieties discussed above. The penultimate stage in (38b) is represented by Rheintal, while the antepenultimate one (HFV, MFV) is perhaps reflected in word-initial velar fronting in Soest and Dorste.[11]

The progression from high front vowels to high and mid front vowels to all front vowels is a consequence of the Implicational Universal for Palatalization

[11]The conclusion is inconclusive because neither Soest nor Dorste possess low front vowels (e.g. /æ/); hence, one cannot know for certain whether or not low front vowels in either of those varieties belongs to the set of triggers.

Triggers (§2.3.3): "If lower front vowels trigger palatalization, then so will higher front vowels". No dialect is attested which fails to obey that hierarchy.

Variation in terms of space (regional dialects) directly reflects changes along the temporal dimension. In particular, dialects with a more restricted set of triggers/targets preserve an earlier historical stage than dialects with the full set of triggers/targets, which represent a later stage. Regions where velar fronting had the greatest set of targets/triggers (e.g. /x ɣ/ in Dorste) represent places where velar fronting has been active longer than those places where velar fronting exhibits a narrower set of targets/triggers (e.g. /x/ in Soest). The reason is that velar fronting has been present longer in the focal areas than in outlying areas and that the change has therefore had more time to expand the number of targets and triggers.

4.5.2 Emergence of the underlying palatal /ʝ/ via Glide Hardening

In all of the studies discussed up to this point the palatal fricative [ç] has a highly restricted distribution in the sense that it only occurs when adjacent to coronal sonorants (or some subset thereof). The limited occurrence of [ç] is captured formally by treating that sound as an allophone of a velar produced by velar fronting. The same generalization holds for the postsonorant palatal [ʝ] in Dorste, which was shown to be a realization of the velar /ɣ/.

One of the challenges in this book is to account for the occurrence of opaque palatals like [ç] occurring in the neighborhood of back sounds. Reference to such dialects was made at various points in previous chapters. One generalization true for the dialects discussed below is that the back vowels adjacent to opaque palatals were etymologically front. Thus, the backing of those front vowels by Vowel Retraction and/or r-Retraction follows if velar fronting was active synchronically at the stage before either retraction process occurred. Thus, retraction resulted in a reassociation of the feature [coronal] from the front vowel trigger to the adjacent dorsal fricative, thereby creating either a palatal quasi-phoneme or a phonemic palatal (/ç/ or /ʝ/).

At issue is the word-initial lenis palatal fricative [ʝ] in all three of the LGm varieties discussed in the present chapter. That sound is an underlying palatal (/ʝ/) because it occurs before front vowels and back vowels. Since the /ʝ/ in question was never the product of assimilatory fronting from an earlier velar it does not have an opaque history. The important point is that [ʝ] (/ʝ/) emerged in the back vowel context even in dialects which otherwise ban fortis palatals in that environment. Given this, what is the phonological reason for the emergence of that [ʝ] (/ʝ/), especially in the context of back vowels?

As noted above, the palatal fricative under discussion is the modern reflex of an earlier palatal glide (WGmc ⁺[j]) by Glide Hardening (=10a). The motivation for that change is syllable structure, since it only affected glides in onset position, while glides in the nucleus or coda were immune. It has long been known that languages impose sonority-based constraints on onset and coda segments. A version of the Sonority Hierarchy is posited in (39), which is similar to the one proposed by Clements (1990) with the exception that rhotics like /r/ are analyzed in (39) as more sonorous than laterals; see Wiese (1996b) and Hall (2002) for discussion of sonority in MoStGm Hall (2011b) for remarks on sonority in a HstAlmc variety spoken in Visperterminen (§6.2). Parker (2011) proposes a very fine-grained version of (39) on the basis of cross-linguistic evidence.

(39) Sonority hierarchy:

Vowels	Glides	Rhotics	Laterals	Nasals	Obstruents
more sonorous ←					→ less sonorous

Languages tend to prefer less sonorous sounds in the onset and more sonorous sounds in the coda. Thus, there is general agreement in phonology that glides (as sonorants) make for poor onsets. This cross-linguistic generalization has been captured formally in various ways, e.g., the Head Law of Vennemann (1988) in the Preference Law framework, the Sonority Dispersion Principle (Clements 1990), or the various Margin Hierarchies in Optimality Theory (e.g. Prince & Smolensky 2004, Clements 1997, Smith 2003 and Hall 2011b to name a few). The reason why glides and not other sonorants (i.e. nasals or liquids) are singled out for hardening in (10a) can be found by considering the sonority of these sounds: According to most versions of the Sonority Hierarchy (as in 39), glides are more sonorous than nasals or liquids. For this reason, syllables like [ja] and [wa] are worse than ones like [na], [la] and [ra] because of the relatively shallow rise in sonority from glide to following vowel.

In sum, the preference for fricatives as opposed to glides in an onset was prioritized over the requirement that palatal fricatives be banned in the context of back vowels.

Since there is solid phonological motivation for Glide Hardening it should not come as a surprise that that change – or something very similar – is independently attested both within and outside of Gmc; see the discussion in Hall (2014b). In early Gmc there was a sound change traditionally referred to as Verschärfung (literally 'sharpening') – otherwise known as Holtzmann's Law (Polomé 1949, Kuryłowicz 1967, Suzuki 1990, Davis & Iverson 1996, and Page 1999) –, which was responsible for the shift of PGmc singleton glides +[j] and +[w] after a short vowel and before a vowel to a geminate obstruent in EGmc (Go) or NGmc (ON). Two examples discussed in the works cited earlier are PGmc +*twa-jē* > Go *twad-djē*, ON *tveggja*, OHG *zweiio* 'two-GEN' and PGmc +*trewa-s* > Go *triggws*, ON *tryggr*, OHG *triuwi* 'true'. Following Page (1999), Verschärfung involved the following two stages: +[VG_aV] > +[V$\text{G}_\text{a}\text{G}_\text{a}$V] > [V$\text{O}_\text{a}\text{O}_\text{a}$V]. Stage 1 converted a singleton glide (G_a) into a geminate glide ($\text{G}_\text{a}\text{G}_\text{a}$) after a short vowel and before a vowel, while the Stage 2 changed that geminate glide into a geminate obstruent ($\text{O}_\text{a}\text{O}_\text{a}$). The relevant part is Stage 2, which involved the exceptionless shift of a geminate glide to a geminate obstruent. That change was similar to my process of Glide Hardening as stated in (10a), but it differed from the latter change because Stage 2 of Verschärfung could not have been motivated as an avoidance of glides in the onset. The reason is that Go [j] did not harden to an obstruent in word-internal onset position. For example, Go *bidjan* 'ask-INF' was syllabified [bid.jɑn], and yet, there is no evidence that the [j] hardened to an obstruent.

These differences aside, it is undeniably the case that Glide Hardening independent of *Verschärfung* has been attested throughout the history of Gmc. For example, Seebold (1982: 174, 183) discusses the change from PIE +[w] to PGmc/WGmc +[k] or +[g], e.g. PIE +daiwēr 'brother-in-law' > PGmc +taikur (cf. OHG *zeihhur*) and PIE +juwnti 'youth' > WGmc +jugunþi (cf. OHG *jugund*). This change was similar to Glide Hardening in (10a) because the target segment was a glide and the output was an obstruent.

Examples of changes in later stages of German show directly or indirectly that Glide Hardening was involved. For example, in MHG, the glide [w] regularly shifted to [b] after liquids in ENHG, e.g. MHG [narwə] > ENHG [narbə] 'scar', MHG [gelwər] > ENHG [gelbər] 'yellow-INFL'; Schirmunski (1962: 368).

A number of non-Gmc languages are attested with Glide Hardening. For example, Harris & Kaisse (1999) investigate alternations between the palatal glide [j] and the lenis nonanterior coronal fricative [ʒ] – ⟦ž⟧ – in Argentinian Spanish, e.g. lé[j] 'law' vs. lé.[ž]-es 'laws'. Harris & Kaisse account for data like these with a rule they dub Coronalization (p. 146), which converts the glide /j/ into the lenis nonanterior coronal fricative in syllable-initial position. Like Glide Hardening in (10a), the rule of Coronalization creates a fricative from a glide in onset position. Baltazani et al. (2016) discuss Glide Hardening in Greek (and in other languages) at length. They demonstrate that Greek has a rule of glide hardening which targets glides in onset position in CjV sequences, turning them into consonants.[12]

[12]Other instances of glide hardening probably involve the assimilation (spreading) of a major class feature ([+consonantal]); see Kaisse (1992). For example, Kamprath (1986) discusses a

4.6 Conclusion

In this chapter I examined the transparent (allophonic) distribution of velars and palatals in three varieties of WLGm, which were defined according to the target segments for postsonorant velar fronting.

The occurrence of palatals and velars holds regardless of the historical source of the triggers and targets for velar fronting. Thus, velars like [x] occur not only in the context of back segments that were historically back but also when adjacent to back sounds that were historically front. Palatals like [ç] likewise surface in the context of front sounds that were etymologically front as well and in the neighborhood of front sounds that were etymologically back. The sounds undergoing velar fronting include not only underlying (etymological) velars but also new velars created from non-velars by independent changes.

The transparent distribution of velars and palatals in the present chapter – and in Chapter 3 – can be contrasted with the opaque distribution of those sounds discussed in the following five chapters. In Chapters 5–6 I consider velar fronting dialects in which some instances of a velar ([x]) occur in the context of front vowels, indicating that velar fronting underapplies. In Chapters 7–9 I consider velar fronting dialects with some instances of a palatal (e.g. [ç]) occurring in the context of a back sound that was etymologically front. In that type of dialect, the historical process of velar fronting overapplies.

process of Glide Hardening in Bergüner Romansh (Switzerland), which converts the glides /j/ and /w/ into into a velar stop in the context before another consonant. The near mirror-image process is attested in Cypriot Greek (Newton 1972a).

5 Underapplication opacity

5.1 Introduction

In the type of system referred to here, velar fronting is an active synchronic process creating palatal [ç] from velar /x/, but that system also includes many instances of velar |x| deriving synchronically from a different sound (/A/). The rule creating |x| from /A/ (=Rule W in Table 2.7) counterfeeds velar fronting. Hence, on the surface there are front vowel plus palatal sequences like [iç] deriving from /ix/ via velar fronting as well as front vowel plus velar sequences like [ix] which originate from /iA/ via Rule W. Velar fronting underapplies because the |x| produced by Rule W potentially feeds velar fronting, but in actuality, it does not. Examples like [ix] from /iA/ via Rule W exemplify underapplication opacity.

From the diachronic perspective, it is argued that velar fronting was phonologized at the end of the grammar (recall Chapters 3 and 4), at which point it applied transparently because it was fed by processes already active in the grammar which created derived velars (|x| from Rule W). Underapplication opacity was the result of velar fronting moving up in the derivation so that it was then counterfed by Rule W.

In §5.2 I discuss a Wph system in which the rule counterfeeding velar fronting is Final Fortition (§4.2). In §5.3 I consider Rpn and SBav varieties in which the opaque velar fricative derives synchronically (and diachronically) from the rhotic phoneme (/ʀ/). In §5.4 I discuss an apparent example of a rule counterbleeding velar fronting in the synchronic grammar. I argue that there is a plausible alternative treatment in which velar fronting is transparent and conclude that the only cases in which velar fronting is opaque in the synchronic grammar involve underapplication in the form of counterfeeding orders. §5.5 provides some discussion of two issues, namely the domain narrowing approach to language change endorsed by Bermúdez-Otero (2007, 2015) and Ramsammy (2015) and linguistic/philological evidence for the historical stages presupposed in this chapter and in Chapters 3 and 4. In §5.6 I conclude.

5.2 Westphalian

The data discussed below have been drawn from the Wph dialect of Rhoden, a district of Diemelstadt, in the German state of Hesse (Martin 1925; 4.2).

Rhoden has front vowels (/i ɪ y ʏ eː ɛː ɛ øː œ æ/), back vowels (/uː u ʊ oː ɔː ɔ ɑː ɑ ə/), diphthongs ending in a front vowel (/ei ɛi øy ɑi iɛ yœ/), and diphthongs ending in a back vowel (/ou ɑu uɔ/). Martin's symbol ⟦ȧ⟧ is transcribed here and below as [æ] because it is low ('niedrig') and front ('Palatal'). The author also notes that ⟦ȧ⟧ is pronounced like the vowel in the English word *fat* ('wird gesprochen wie das *a* in englisch *fat*'). Three vowels are not taken into consideration below (Martin's ⟦ø̨⟧,⟦ā̇⟧,⟦ǡ⟧) because no dorsal fricatives were found in the original source after those sounds. Rhoden possesses the four dorsal fricatives [x ç ɣ ʝ]. The relationship between those sounds is depicted in (1) for the environment after a sonorant, which is the context I focus on below.[1] The Rhoden system in (1) is strikingly similar to the one in the related Wph variety of Soest (§4.3), although the crucial difference between the two is that only Rhoden is characterized by counterfeeding opacity.

(1) /x/ → [x] [ç]; /ʝ/ → [ʝ]

The patterning of [ç] in (1) requires that vowels be marked for the distinctive feature [±low]. As indicated in Table 5.1, that feature is assigned to all vowels. Those vowels marked [−low] receive the feature [±high], and if two vowels share that height feature then they are distinguished with [±tense]. All phonemic vowels are listed here with the exception of schwa, which is placeless. The features for vowels in Table 5.1 also hold for the individual components of the diphthongs. Most significantly, the second part of /ei ɛi øy ɑi iɛ yœ/ is [coronal] and [−low]. Four vowel pairs in Table 5.1 are listed together under the same column (/ɛː ɛ/, /uː

[1]The word-initial system for Rhoden consists of the etymological palatal [ʝ] (/ʝ/), [g] (/g/), and [x] (/x/) in [ʃx] (/ʃx/) clusters. The [x] in [ʃx] (<WGmc +[sk]) surfaces even before front vowels, e.g. [ʃxip] 'ship'. Since [g] (< WGmc +[ɣ]) only occurs in word-initial position (Martin 1925: 51–53) I treat it as a word-initial allophone of /ɣ/, as in Dingelstedt am Huy (§8.4). Martin (1925: 14) writes that velar stops (his ⟦k⟧ and ⟦g⟧) and the velar nasal (his ⟦ŋ⟧) also have a palatal realization, although he does not describe the context, nor does he transcribe the palatals in question with separate symbols. As I point out in §11.2, the claim that there are fronted variants of [k g ŋ] is not uncommon in descriptive work during the period in which Bernhard Martin penned his grammar of Rhoden.

u/, /ɔː ɔ/, /ɑː ɑ/). The two vowels in each of those pairs differ in terms of length units, which are not given here.

Table 5.1: Distinctive features for vowels (Rhoden)

	i	ɪ	eː	ɛː ɛ	æ	y	ʏ	øː	œ	uː u	ʊ	oː	ɔː ɔ	ɑː ɑ
[coronal]	✓	✓	✓	✓	✓	✓	✓	✓	✓					
[dorsal]										✓	✓	✓	✓	✓
[labial]						✓	✓	✓	✓	✓	✓	✓	✓	
[low]	−	−	−	−	+	−	−	−	−	−	−	−	−	+
[high]	+	+	−	−		+	+	−	−	+	+	−	−	
[tense]	+	−	+	−		+	−	+	−	+	−	+	−	

The data in (2) and (3) reveal that [x] occurs after a back vowel (in 2a-g) or the [+low] front vowel [æ] (in 2h) and that [ç] surfaces after a [−low] front vowel (in 3). There are no examples in which /x/ occurs after a consonant. The [x ç] in these examples derive historically from WGmc +[x].

(2) Postvocalic [x] from /x/:

a. jūxən [juːxən] jauchzen ‘cheer-INF’ 35
b. jux [jux] euch ‘you-ACC/DAT PL’ 229
c. bụxt [bʊxt] Bucht ‘bay’ 201
d. dọxtər [dɔxtər] Tochter ‘daughter’ 63
e. nɑxt [nɑxt] Nacht ‘night’ 63
f. hɑux [hɑux] hoch ‘high’ 223
g. duọxt [duɔx] doch ‘however’ 206
h. šlɑxt [ʃlæxt] schlecht ‘bad’ 63
hɑx [hæx] Hauch ‘breath’ 221

(3) Postvocalic [ç] from /x/:

a. lịχtə [lɪçtə] leicht ‘light’ 63
ịnzịχt [ɪnzɪçt] Einsicht ‘insight’ 228
b. ly꜀χtən [lʏçtən] leuchten ‘glow-INF’ 63
c. lẹχt [lɛçt] Licht ‘light’ 63
trẹχtər [trɛçtər] Trichter ‘funnel’ 20
d. fərnø̣χtərən [fərnœçtərən] ernüchtern ‘sober-INF’ 211

The data in (3) indicate that [ç] surfaces in coda position after any one of the four [−low] short lax vowels [ɪ ʏ ɛ œ] provided that [t] follows; recall from §4.3 that this is a pattern common among Wph dialects.

Since Rhoden lies in the vicinity of the HGm dialect continuum (NHes), it is not surprising that the dialect has adopted copious HGm loanwords, as in (4). These data illustrate that velar [x] surfaces after any back vowel (in 4a), palatal [ç] after any [−low] front vowel (in 4b), and velar [x] after the front [+low] vowel [æ] (in 4c).

(4) [x]/[ç] (from /x/) after vowels in loanwords:

a.	lǫx	[lɔx]	Loch	'hole'	49
	drɑxə	[drɑxə]	Drache	'dragon'	49
b.	ry¸χən	[rʏçən]	riechen	'smell-INF'	124
	šprịχələn	[ʃprɪçələn]	hochdeutsch sprechen 'speak-INF High German'		270
	leiχə	[leiçə]	Leiche	'body'	49
	keiχən	[keiçən]	keuchen	'gasp-INF'	231
	zęiχən	[zɛiçən]	seichen	'piss-INF'	260
	šmęiχəln	[ʃmɛiçəln]	schmeicheln	'flatter-INF'	266
	gnøyχələn	[gnøyçələn]	lächeln	'smile-INF'	220
c.	frɑx	[fræx]	frech	'impudent'	49

The items listed in (4b) with diphthongs ([ei ɛi øy]) are important because they show that [ç] occurs after any [−low] front vowel and not simply after the four [−low] short lax vowels [ɪ ʏ ɛ œ] in the native examples in (3).

Velar [ɣ] (=⟦ɣ⟧) surfaces in a word-internal onset after a sonorant; recall Soest (§4.3). The following examples exemplify the occurrence of [ɣ] after a back vowel (in 5a), the [+low] front vowel (in 5b), a [−low] front vowel (in 5c), or liquid (in 5d).

(5) Postsonorant [ɣ] (from /ɣ/):

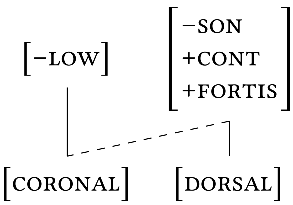
a.	frǭɣən	[frɔː.ɣən]	fragen	'ask-INF'	52
	rǫɣən	[rɔ.ɣən]	Roggen	'rye'	52
	mɑɣən	[mɑː.ɣən]	Magen	'stomach'	52
	zouɣən	[zou.ɣən]	saugen	'suck-INF'	34
b.	zɑɣən	[zæ.ɣən]	säen	'sow-INF'	260
c.	iɣəl	[i.ɣəl]	Igel	'hedgehog'	52
	drịɣərt	[drɪ.ɣərt]	¾ Morgen	'ca. 1 acre'	52

	bry̨ɣə	[brʏ.ɣə]	Brücke	‘bridge’	52
	wę̄ɣə	[wɛ.ɣə]	Weck	‘bread roll’	52
	šnę̄ɣəl	[ʃnɛː.ɣəl]	Schnecke	‘snail’	52
	mø̨ɣə	[mœ.ɣə]	Mühe	‘trouble’	54
	zɑiɣən	[zɑi.ɣən]	säugen	‘lactate-INF’	52
d.	fɑlɣə	[fæl.ɣə]	Felge	‘wheel rim’	52
	zuǫrɣə	[zuɔr.ɣə]	Sorge	‘sorrow’	52

The items listed in (5c) show that /ɣ/ is not a target for velar fronting (see below). Martin (1925: 52) is clear on this point when he writes that [ɣ] surfaces in word-internal position even after a front vowel (‘auch nach palatalem vocal’).

The data in (3–4) show that [ç] occurs after a [−low] front vowel and velar [x] in the elsewhere case. [x]/[ç] derive from /x/ by (6). Note that Velar Fronting-5 is distinct from Velar Fronting-2 (§3.4) because only the former requires that the target be specified for a laryngeal feature ([+fortis]).

(6) Velar Fronting-5:



The set of triggers for Velar Fronting-5 consists of all [−low, coronal] segments. Since [±low] is distinctive only for vowels and not for consonants there is no need to specify the leftmost segment of that rule (the target) as [−consonantal]. The loanword data in (4) are significant because they show that fronting is triggered by any [−low] front vowel and not simply by the four [−low] short lax vowels present in the native words in (3).

As in Soest, many morphemes in Rhoden exhibit [x]~[ɣ] alternations, where both fricatives derive historically from WGmc ⁺[ɣ]. The word pairs in (7) illustrate that [x] is in the coda and [ɣ] in a word-internal onset. [x] surfaces after back vowel (in 7a-e) or liquid (in 7f). By contrast, [ɣ] can surface after any type of sound, i.e. front vowel, back vowel or liquid. As indicated below the sound underlying [x]~[ɣ] alternations as in (7) is /ɣ/.

(7) [x]~[ɣ] alternations (from /ɣ/):

a.	plōx	[ploːx]	Pflug	‘plow’	254
	plø̄ɣən	[pløː.ɣən]	pflügen	‘plow-INF’	254

b.	dɑx	[dɑx]	Tag	'day'	52
	dɑɣən	[dɑ.ɣən]	Tage	'days'	202
c.	kynəx	[ky.nəx]	König	'king'	86
	kynəɣə	[ky.nə.ɣə]	Könige	'kings'	86
d.	truǫx	[truɔx]	Trog	'trough'	86
	truǫɣə	[truɔ.ɣə]	Tröge	'troughs'	86
e.	flɑux	[flɑux]	flog	'flew-PRET'	74
	flēɣən	[fleː.ɣən]	fliegen	'fly-INF'	213
	flyøɣən	[flyœ.ɣən]	flögen	'fly-SUBJ'	26
f.	bɑlx	[bɑlx]	Balg	'brat'	86
	bɑlɣə	[bæl.ɣə]	Bälge	'brats'	86

Similar fortis vs. lenis alternations involve other fricative (and stop) pairs, e.g. [glɑs] 'glass' vs. [glɛː.zə.rə] 'glasses'.

Fortis-lenis alternations like the ones in (7) are captured with underlying lenis sound (/ɣ/), which surface as fortis in coda position by Final Fortition (§4.2) in (8). Nonalternating fortis sounds are underlyingly fortis, e.g. /x/ in [lɑ.xən] 'laugh-INF'.

(8) Final Fortition:
[−sonorant] ⟶ [+fortis] / __ C_0 $]_\sigma$

The words in (9) are like the ones in (7) in the sense that they exhibit [x]~[ɣ] alternations derived from /ɣ/. In contrast to the items presented in (7), the segment preceding the [x] in (9) is a [−low] front vowel. The significance of the data in (9) is the |x| created by Final Fortition does not undergo Velar Fronting-5. Hence, the |x| produced by Velar Fronting-5 is opaque and not transparent.

(9) [ɣ]~[x] alternations (from /ɣ/):

a.	zę̄ɣən	[zɛː.ɣən]	sagen	'say-INF'	82
	zę̄x	[zɛːx]	sag	'say-IMP SG'	82
	zięxtə	[ziɛx.tə]	sagte	'said-PRET'	82
	əzięxt	[əziɛxt]	gesagt	'said-PART'	82
b.	wę̄x	[βɛːx]	Weg	'path'	85
	wę̄ɣə	[βɛː.ɣə]	Wege	'paths'	85
c.	ęɣən	[ɛ.ɣən]	eggen	'harrow-INF'	80
	ięxtə	[iɛx.tə]	eggte	'harrowed-PRET'	80
d.	lę̄ɣən	[lɛː.ɣən]	legen	'place-INF'	240
	ų̨ngəlięxt	[ʊngəliɛxt]	ungelegt	'unplaced'	279

e.	kreiɣən	[krei.ɣən]	kriegen	'wage war-INF'	236
	kreix	[kreix]	Krieg	'war'	236
f.	dɑɣən	[dɑː.ɣən]	tagen	'hold a meeting-INF'	202
	dę̄xlək	[dɛː.x.lək]	täglich	'daily'	203
g.	myɣən	[my.ɣən]	mögen	'like-INF'	246
	myxlək	[myx.lək]	möglich	'possible'	246
h.	tøyɣə	[tøy.ɣə]	Zeuge	'witness'	277
	tøyxnịs	[tøyx.nɪs]	Zeugnis	'testimonial'	277

Martin does not provide examples for [x] (from /ɣ/) after any of the four [−low] short front lax vowels ([ɪ ʏ ɛ œ]) present in the (native) items in (3), but I consider this to be an accident. In particular, Martin's description of the inflectional morphology (pp. 72–95) implies that there should be examples in which [x] (from /ɣ/) also occurs after [ɪ ʏ ɛ œ]. For example, the [ɣ] in a word-internal onset surfaces in coda position as [x] in the imperative singular of weak verbs, e.g. [zɛːx] 'say-IMP SG' (in 9a). Rhoden has several weak verbs with vowels like [ɪ ʏ ɛ œ] followed by /ɣ/, e.g. [ʃpɪɣən] 'spit-INF' (=⟦špịɣən⟧), which presumably surface with [x] after the same stem vowel in the imperative singular, but these examples are not provided in the original source.

It is interesting to consider the passages in Martin (1925) describing the data presented above because he indicates not only that he is aware of the regular patterning of [x] and [ç] but also the aberrant instances of [x]. For example, Martin (1925: 63) states with respect to (3) that WGmc ⁺[x] (before [t]) is realized as [ç] after a front vowel ('nach palatalen [Vocalen]'.) However, Martin (1925: 14) also notes in the introduction that quite often one hears [x] after a front vowel (' ...hört man sehr oft *x* ... nach palatalen Vocalen'.) It is especially significant to observe that Martin (1925: 52) recognizes that the modern reflex of historical ⁺[ɣ] in (10) is a voiceless velar fricative in coda position *even if the preceding vowel is front* (my emphasis). He writes: "Im Auslaut wird wg. *g* (=⁺[ɣ]) zum stimmlosen velaren Spiranten (auch bei vorausgehenden palatalen Vocalen)...".

The examples given above show that it is difficult to find examples in which [x] and [ç] occur after precisely the same vowel. As noted earlier, for historical reasons [ç] (from /x/) is only attested after the four [−low] front vowels [ɪ ʏ ɛ œ] and before [t]. By contrast, the bulk of the native examples with [x] (from /ɣ/) show that fricative occurring after vowels other than [ɪ ʏ ɛ œ]. What is more, it is clear from (3) that [ç] (from /x/) surfaces after any [−low] front vowel and that the opaque [x] derives from /ɣ/.

Opaque examples like the ones in (10) are accommodated by ensuring that only an underlying /x/ but not the |x| derived from /ɣ/ by Final Fortition (Fnl For) undergoes Velar Fronting-5 (Vel Fr-5). This is captured in (10a), which illustrates underapplication (counterfeeding) opacity. The two examples are drawn from (9a) and (3c).

(10)	a.			b.			
		/zeːɣ/	/lɛxt/			/zɛːɣ/	/lɛxt/
	Vel Fr-5	-------	lɛçt		Fnl For	zɛːx	------
	Fnl For	zɛːx	------		Vel Fr-5	zɛːç	lɛçt
		[zɛːx]	[lɛçt]			*[zɛːç]	[lɛçt]
		‘say-IMP SG’	‘light’				

If the output of Final Fortition were to feed Velar Fronting-5 (in 10b), then the derived fortis dorsal fricative |x| in words like /zɛːɣ/ ‘say-IMP SG’ would incorrectly surface as the palatal [ç]. The distinction between an underlying /x/ and a derived |x| is correctly captured in (10a) if Final Fortition counterfeeds Velar Fronting-5. This means that the underlying /x/ in words like /lɛxt/ ‘light’ shifts to a palatal |ç| before the underlying /ɣ/ in words like /zeːɣ/ ‘say-IMP SG’ becomes a fortis velar [x] by Final Fortition. The opaque system in (10a) is a specific example of the hypothetical Dialect G from Figure 2.8.

The development of the three typical words (from 3c and 9a) is depicted in (11) for the three historical stages referred to in previous chapters. For each stage the underlying representation and the phonetic representation are provided.

(11)				
	/zɛːɣ-ən/	/zɛːɣ/	/lɛxt/	
	[zɛː.ɣən]	[zɛːx]	[lɛxt]	Stage 1
	/zɛːɣ-ən/	/zɛːɣ/	/lɛxt/	
	[zɛː.ɣən]	[zɛːç]	[lɛçt]	Stage 2
	/zɛːɣ-ən/	/zɛːɣ/	/lɛxt/	
	[zɛː.ɣən]	[zɛːx]	[lɛçt]	Stage 3
	sagen	*sag*	*Licht*	MoStGm
	‘say-INF’	‘say-IMP SG’	‘light’	

It is assumed above that Final Fortition was already present in the grammar at Stage 1; see §5.5.2 for discussion. Stage 2 depicts the point where Velar Fronting-5 was phonologized at the end of the grammar. Examples like [zɛːç] ‘say-IMP SG’ and [lɛçt] ‘light’ indicate that the rule was transparent because it was fed by Final Fortition. The dialect of Rhoden as it was described in 1925 by Bernhard Martin is represented by Stage 3. Stage 2 in (11) is attested in Soest (§4.3), which is repeated in (12). Recall that this transparent system is a specific example of the hypothetical Dialect A from Figure 2.5.

(12)

	/strɣ-st/	/fʀœxt-n̩/
Fnl For	stɪx-st	------
Vel Fr-5	stɪçst	fʀœçtn̩
	[stɪçst]	[fʀœçtn̩]
	'climb-2sg'	'fear-inf'

Stage 3 in (11) therefore involved the change from a transparent relationship between Final Fortition and Vel Fr-5 in (12) to the opaque relationship in (10a).

In §2.5 I described the historical model adopted in this book, which sees change from one stage to the next as one involving a speaker pronouncing words which are then misperceived by listeners in acquisition. It is this misparsing of sounds uttered by adults that leads to the acquisition of the rule of velar fronting.

The change from transparent Stage 2 to opaque Stage 3 in (11) does not involve misperception. The interesting example is the shift from Stage 2 [zɛːç] 'say-imp sg' to Stage 3 [zɛːx]. If a speaker (P_1) utters [zɛːç] (from /zeːɣ/) at Stage 2 then the listener (P_2) correctly hears [zɛːç] and hence the question is why P_2 would opt for the Stage 3 opaque realization ([zɛːx]) rather than the Stage 2 transparent one ([zɛːç])? The answer is that P_2 has adopted a feature specific paradigm uniformity constraint (e.g. Downing et al. 2005): P_2 posits that the place of articulation of consonants in the cells of paradigms (verb conjugations and noun/adjective declensions) must remain the same. Given that requirement, the Stage 2 alternation between velar ([ɣ]) and palatal ([ç]) in examples like [zɛː.ɣən] vs. [zɛːç] is levelled to velar at Stage 3, namely [zɛː.ɣən] vs. [zɛːx]. Since P_2 is already aware of fortis vs. lenis alternations like the one in (7), (s)he has internalized Final Fortition and knows that the fortis vs. lenis alternation in pairs of words like [zɛː.ɣən] vs. [zɛːx] requires /ɣ/ and not /x/. For these reasons, P_2 posits a Stage 3 grammar in which Final Fortition counterfeeds velar fronting.

The description of changes involving dorsal fricatives in Martin's (1925) grammar can be confirmed in the 97-page appendix of that work, which consists of a list in alphabetical order (in phonetic transcription) of all of the words cited in the grammar. An examination of that list also includes a small number of items within which [x] (from /x/) unexpectedly occurs after a front vowel; see (13).

(13)

a.	gəšxi̯xtə	[gəʃxɪxtə]	Geschichte	'history'	188, 218
b.	fy˛xtə	[fʏxtə]	Feuchte	'humidity'	36, 216
c.	nø̨xtərən	[nœxtərən]	nüchtern	'sober'	34, 248
d.	lę̨xt, lęχt	[lɛxt], [lɛçt]	Licht	'light'	40, 63, 87, 240
e.	tręxtər, tręχtər	[trɛxtər], [trɛçtər]	Trichter	'funnel'	20, 277

I refer to the words in (13) with [x] as irregularities to the otherwise regular process fronting /x/ after [−low] front vowels (Velar Fronting-5). For reasons that will become clear in §12.8.3 the words in (13) with the pronunciation [x] do not exemplify lexical exceptions as that term is usually employed in the literature.

Consider first the three items in (13a–c). Martin (1925: 218) transcribes the word *Geschichte* 'history' in (13a) with his symbols for [ɪx] in both the appendix (p. 218) and in his transcription of an informant's recitation of a fairy tale (p. 188). One might argue that the post-[ɪ] dorsal fricative in [gəʃxɪxtə] is [x] and not [ç] because the vowel [ɪ] is preceded by [x]. This cannot be the correct interpretation because there are other words in which [ç] surfaces as expected after [ɪ] even though [x] precedes the vowel, e.g. [ʃxɪçt] 'shift' (Martin 1925: 262). Note too that the second [x] in [gəʃxɪxtə] occurs after the vowel [ɪ] but that the words [lɪçtə] 'light' and [ɪnzɪçt] 'insight' from (3) show the regular pattern whereby /x/ surfaces as [ç] after that vowel. The same point holds for [fʏxtə] 'humidity' in (13b) in which the [x] contrasts with the [ç] in [lʏçtən] 'glow-INF' from (3). In [nœxtərən] 'sober' in (13c) the velar [x] similarly surfaces unexpectedly after the nonlow front vowel [œ], but in [fərnœçtərən] 'sober-INF' from (3), [ç] occurs as expected after [œ].

The items in (13d,e) differ from the ones in (13a-c) because they exhibit both the expected pronunciation with [ç] as well as the unexpected pronunciation with [x]. The pronunciation with [x] for (13d) occurs only once (p. 240) and the realization with a palatal three times (p. 40, 63, 87). The pronunciation with [x] for (13e) is attested once (p. 277) and the expected realization with a palatal once (p. 20).

One might argue that Martin's ⟦x⟧ in (13) is merely a transcriptional error, but I consider that interpretation to be dubious. First, as indicated in the page numbers listed in the final column of (13), several of the irregular words are transcribed with ⟦x⟧ at more than one point in Martin's grammar. For example, if the word *Geschichte* were incorrectly transcribed with ⟦x⟧ after the vowel ⟦i̯⟧ on p. 218, what are the chances that Martin would make precisely the same mistake in the same word on p. 188? Note too that two other words are given on p. 218 in which Martin's ⟦χ⟧ (=[ç]) surfaces after ⟦i̯⟧, namely ⟦gəzi̯χtə⟧ 'face' (=[gəzɪçtə]) and ⟦gəri̯χt⟧ 'dish' (=[gərɪçt]). Second, the aberrant items in (13) always involve ⟦x⟧ after a [−low] front vowel, but never ⟦χ⟧ after a [+low] front vowel or back vowel. That generalization correlates with the author's observation commented on earlier that velar [x] is often heard in the front vowel context. If the ⟦x⟧ in (13) were simply a transcriptional error, then one would expect the author to also incorrectly transcribe a palatal ⟦χ⟧ after the vowels [uː u ʊ oː ɔː ɔ ɑː ɑ ə] or [æ], but no such examples are present in Martin (1925). Third, several commentators have observed that [x] can surface in the neighborhood of front vowels in ELGm even when velar fronting can be shown to be active (see §12.8.3 for discussion). Hence, the unexpected items in (13) appear to be representative of LGm in general.

I claim that there is a connection between the items in (13) and the opaque [x] in (9), although further study is necessary to determine the nature of that connection. According to one scenario (Analysis A), when Velar Fronting-5 was operative at Stage 2 in (11) it was not only transparent (because it was fed by Final Fortition), but also regular (because there were no items like the ones in 14). At some point still at Stage 2 irregularities emerged, e.g. the earlier realization [gəʃxɪçtə] 'history' was replaced with the irregular [gəʃxɪçtə] in (13a), and then eventually more aberrant items arose. The presence of those words eventually signalled to the listener that sequences such as [ɪx] are acceptable, which then served as a catalyst for the shift from Velar Fronting-5 as a rule applying at the end of the grammar at Stage 2 to an opaque rule counterfed by Final Fortition at Stage 3. According to a second alternative (Analysis B), it was the other way around: At Stage 2 there were no irregularities at all, and then Velar Fronting-5 moved up so that it was counterfed by Final Fortition. According to Analysis B it was the presence of opaque examples like [zɛːx] say-IMP SG' (from /zɛːɣ/) that signaled to the listener that [x] is acceptable after a nonlow front vowel, which then served as a catalyst for the emergence of the items in (13).

At this point one cannot know for certain which of the two scenarios is the more likely. On the one hand there are LGm varieties referred to earlier (discussed in §12.8.3) with irregularities like the ones in (13) but no opaque forms, which would argue against Analysis B. However, there are also dialects with opacity but without irregularities (§5.3.1), which would pose a problem for Analysis A.

To summarize, the Rhoden system involving underapplication opacity (recall 10) is unique. Although several other varieties of German are described in §5.3 where a rule creating a fortis dorsal fricative |x| counterfeeds velar fronting, the derived |x| in those dialects derives synchronically (and diachronically) from the rhotic phoneme. By contrast, Rhoden is the only dialect discovered in the present survey where Final Fortition creates |x| from /ɣ/, which in turn counterfeeds velar fronting.[2]

[2]There is scant evidence from a brief description of the variety of LFr of Homberg (Meynen 1911; Footnote 5.1) suggesting that there is a similar pattern attested elsewhere. Homberg has a version of velar fronting in which the target is /x/ and the trigger is any preceding front vowel. Meynen gives a very small number of words ending in a front vowel plus [x], but in those examples the [x] derives from [ɣ] which was followed historically be schwa, e.g. ⟦zæ¹x⟧ 'saw' (cf. MoStGm *Säge*). That word can be compared to one in which [x] derives from /x/, where

5.3 Opaque realization of /r/ and velar fronting

German velar fronting dialects are attested in which the rhotic consonant (/ʀ/) is realized as a fortis velar fricative ([x]) in the context after front vowels. The most detailed treatment of that opaque rhotic reported in the literature to my knowledge is a Rpn variety described in §5.3.1. §5.3.2 investigates a strikingly similar pattern for a community of early twentieth century SBav speakers in Silesia. §5.3.3 discusses the areal distribution of counterfeeding opacity in German dialects

5.3.1 Ripuarian

The data given below are drawn from Hall (1993), who describes and analyzes the speech of several informants living in the general vicinity between Düsseldorf and Cologne (Köln); see Footnote 5.1. Following the original source, I refer to this Rpn variety as Lower Rhine German (LRGm).

LRGm has the same vocalic sounds as MoStGm (§17.2), namely front vowels /iː ɪ yː ʏ eː ɛː ɛ øː œ/, back vowels /uː u ʊ oː ɔ ɑː ɑ ə/), and diphthongs ending in a front vowel (/ɑi ɔy/) or back vowel (/ɑu/). The relationship between the two surface dorsal fricatives are [x] and [ç], which only occur in postsonorant position, is depicted in (14).[3]

(14) /x/

[x] [ç]

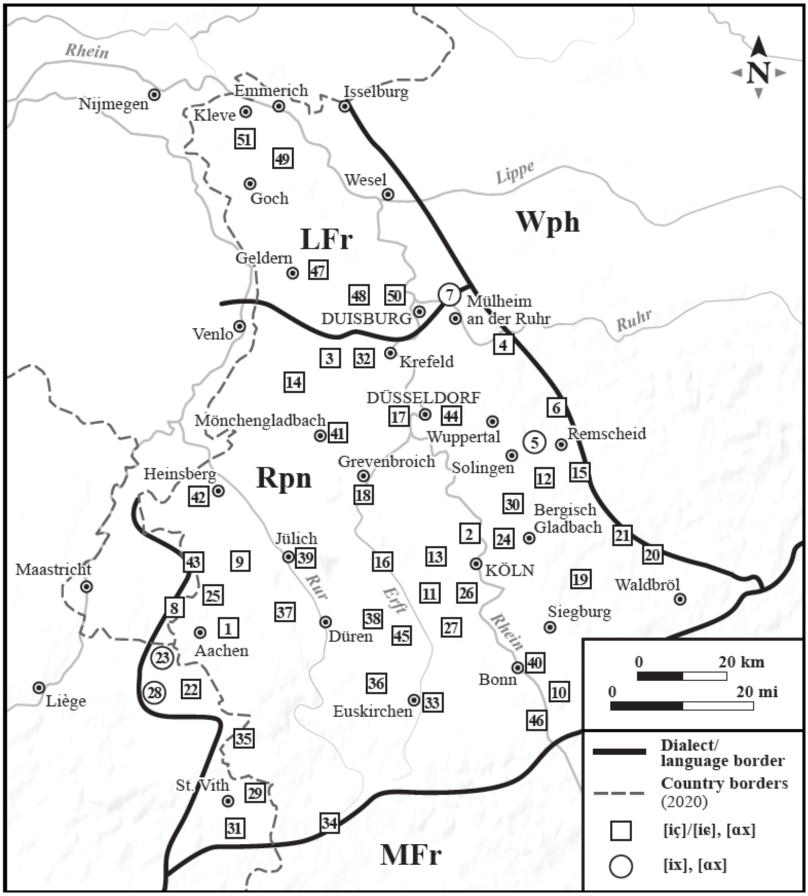
[x] occurs after a back vowel (in 15a) and [ç] after a front vowel (in 15b) or a sonorant consonant (in 15c).[4]

(15) [x] and [ç] (from /x/):

there was no following schwa, e.g. ⟦ræ^{1}χ⟧ 'right' (cf. MoStGm *recht*). Since Meynen (1911) does not provide enough data to draw the correct conclusions I do not discuss this example further.

[3] Hall (1993) transcribes [x] narrowly as uvular (⟦χ⟧). The etymological palatal [ʝ] surfaces word-initially before any vowel. LRGm has no [ɣ] because g-Formation-1 (§4.2) restructured WGmc $^{+}$[ɣ] (/ɣ/) to [g] (/g/). As in MoStGm, LRGm [g] alternates with [ç] after the front vowel [ɪ], e.g. [køːnɪç] 'king' vs. [køːnɪgə] 'kings' (§1.2). I ignore data like these because they are peripheral; see §17.2 for discussion.

[4] In contrast to some of the dialects discussed earlier (e.g. Ramsau am Dachstein in §3.5 and Soest in §4.3), palatal [ç] surfaces unexpectedly in LRGm after the back vowel [ɐ] (from /ʀ/), e.g. [dʊɐç] 'through'. This is an example of a palatal quasi-phoneme, which is discussed in detail in Chapter 7 for several other regional varieties and in §17.2 for MoStGm.



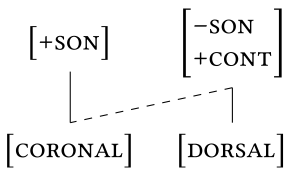
Map 5.1: Ripuarian (Rpn) and Low Franconian (LFr). Squares indicate post-sonorant velar fronting and circles no postsonorant velar fronting. 1=Rovenhagen (1860), 2=Wahlenberg (1877), 3=Röttsches (1877), 4=Koch (1879), 5=Holthausen (1885), 6=Holthaus (1887), 7=Maurmann (1889), 8=Jardon (1891), 9=Schmitz (1893), 10=Müller (1900), 11= Münch (1904 [1970]), 12=Hasenclever (1905), 13=Müller (1912), 14=Frings (1913), 15=Lobbes (1915), 16=Grass (1920), 17=Zeck (1921), 18=Greferath (1922), 19=Mackenbach (1924), 20=Branscheid (1927) (Eckenhagen), 21=Branscheid (1927) (Berghausen), 22=Welter (1929), 23=Welter (1933), 24=Bubner (1935), 25=Welter (1938), 26=Heike (1964), 27=Heike (1970), 28=Jongen (1972), 29=Hecker (1972), 30=Heinrichs (1978), 31=Cajot & Beckers (1979), 32=Bister-Broosen (1989), 33–42=Cornelissen et al. (1989) (Euskirchen (33), Dahlem (34), Monschau (35), Zülpich (36), Langerwehe (37), Nörvenich (38), Jülich (39), Bonn (40), Mönchengladbach (41), Heinsberg (42), 43=Hinskens (1992), 44=Hall (1993), 45=Kreymann (1994), 46=Fuss (2001), 47=Ramisch (1908), 48=Meynen (1911), 49=Hanenberg (1915), 50=Bethge & Bonnin (1969), 51=Stiebels (2013).

a.	[tuːx]	Tuch	'towel'
	[bʊxt]	Bucht	'bay'
	[hoːx]	hoch	'high'
	[kɔx]	Koch	'cook'
	[bɑx]	Bach	'stream'
	[nɑːx]	nach	'after'
	[bɑux]	Bauch	'stomach'
b.	[ziːç]	siech	'ailing'
	[lɪçt]	Licht	'light'
	[gəʀʏçt]	Gerücht	'rumor'
	[ʀɛçt]	recht	'right'
	[ʀaiç]	Reich	'empire'
	[ɔyç]	euch	'you-ACC/DAT PL'
c.	[mœnç]	Mönch	'monk'
	[dɔlç]	Dolch	'dagger'

Umlaut alternations predictably trigger the occurrence of [x] or [ç], e.g. [buːx] 'book' vs. [byːçɐ] 'books'.

The complementary distribution of [x] and [ç] is expressed by analyzing [ç] as a positional variant of /x/. The rule capturing the data in (15) is Velar Fronting-1, which is reproduced in (16).

(16) Velar Fronting-1:



Since the opaque [x] discussed below derives from /ʀ/ it is essential that the phonological patterning and phonetic realization of that liquid be addressed.

As is MoStGm, the one underlying rhotic (/ʀ/) patterns in LRGm as a [+sonorant] sound, although it can optionally surface as an obstruent ([ʁ]). The disconnect between the phonological patterning and the phonetic realization is discussed at length in Hall (1993). The claim defended in that work – also adopted here – is that the realization of /ʀ/ as an obstruent is expressed as an optional synchronic process that has become phonologized in LRGm.

/ʀ/ is phonologically a sonorant because it patterns together with other sonorants in terms of syllabification. German syllables obey the SONORITY SEQUENCing Generalization (e.g. Clements 1990, Parker 2011) in the sense that syllable-initial clusters exhibit a sonority rise (from left to right) and syllable-final clusters a sonority fall (from left to right). The Sonority Hierarchy for German (§4.5.2) makes crucial reference to /ʀ/

The distinction between /ʀ/, /l/ and the nasals derives motivation from the fact that word-final /ʀ/+/l/, /l/ + nasal and /ʀ/ + nasal are all parsed as coda clusters (see 17a), while /l/ + /ʀ/, nasal + /l/, and nasal + /ʀ/ in the same context are heterosyllabified (see 17b).

(17)	a.	[kɛʀl]	Kerl	'fellow'
		[fɪlm]	Film	'film'
		[ɑʀm]	Arm	'arm'
		[tsɔʀn]	Zorn	'anger'
	b.	[kɛlɐ]	Keller	'cellar'
		[tʊnl̩]	Tunnel	'tunnel'
		[hɪml̩]	Himmel	'sky'

The Sonority Hierarchy supports the analysis of /ʀ/ as a [+sonorant] sound. Were /ʀ/ analyzed as [−sonorant] then the generalization would be lost that the entire natural class of [+sonorant] sounds is more sonorous than the class of [−sonorant] sounds.

A number of studies have shown that one of the realizations of German /ʀ/ is a lenis uvular fricative ([ʁ]), e.g. Ulbrich (1972), Kohler (1977: 169). In particular, the amount of constriction in the vocal tract for the consonantal rhotic can increase to the point where friction occurs. According to Ulbrich (1972), the most common realization of the consonantal (nonvocalized) rhotic is the fricative [ʁ], although a non-fricative sound ([ʀ]) is also common.[5] Data displaying the variation between the sonorant [ʀ] and the obstruent [ʁ] are presented for word-initial position (in 18a), between vowels (in 18b), the second member of an onset cluster (in 18c), and coda position after a short vowel (in 18d).

(18)	a.	[ʀɑːzən], [ʁɑːzən]	Rasen	'lawn'
	b.	[mʏʀɪʃ], [mʏʁɪʃ]	mürrisch	'sullen'
	c.	[dʀɑŋ], [dʁɑŋ]	Drang	'impulse'
	d.	[hɛʀ], [hɛʁ]	Herr	'gentleman'

[5] The non-fricative articulation referred to here is either a trill or an approximant. The distinction between those two realizations is not important in the following discussion because both trills and approximants are [+sonorant] from the point of view of phonology.

The data discussed above require the optional operation in (19), which converts the sonorant /ʀ/ into the corresponding obstruent. Desonorization-2 differs minimally from Desonorization-1 (§3.6), which is not context-free.

(19) Desonorization-2:

$$\begin{bmatrix} +\textsc{cons} \\ +\textsc{son} \\ -\textsc{nasal} \\ \textsc{dorsal} \end{bmatrix} \rightarrow \begin{bmatrix} -\textsc{son} \\ +\textsc{cont} \end{bmatrix}$$

One might assume that the variation in (18) is purely phonetic and not phonological. This might be the case in some German dialects, but it will be argued below that Desonorization-2 was phonologized in LRGm because the derived sound it creates (|ʁ|) forms the input to the rule creating the opaque [x] which itself is nondistinct from underlying /x/. Since the assimilatory operation posited below creating opaque [x] is a phonological rule, the implication is that Desonorization-2 cannot be a rule of phonetic implementation; recall the relationship between Phonology and Phonetics in Figure 2.1.

/ʀ/ vocalizes to [ɐ] in coda position. Alternations between [ɐ] and [ʀ]/[ʁ] are presented in (20). The change from /ʀ/ to [ɐ] by r-Vocalization (§4.3) in (21) is obligatory after a long vowel (in 20a) and optional after a short vowel (in 20c). I offer no explanation for the condition on optionality.[6]

(20)	a. [tiːɐ]	Tier	‘animal’
	b. [tiː.ʀə], [tiː.ʁə]	Tiere	‘animals’
	c. [hɛɐ], [hɛʀ], [hɛʁ]	Herr	‘gentleman’
	d. [hɛ.ʀən]	Herren	‘gentlemen’

(21) r-Vocalization:

$$\begin{bmatrix} +\textsc{cons} \\ +\textsc{son} \\ -\textsc{nasal} \\ \textsc{dorsal} \end{bmatrix} \rightarrow \begin{bmatrix} -\textsc{cons} \end{bmatrix} \;/\; \underline{\quad\quad}\; C_0 \;]_\sigma$$

Condition: Optional after a short vowel

The data in (15) suggest that the distribution of [x] and [ç] is fully transparent. That this is not the case, is illustrated in the additional data below. Those

[6]The vocalized-r is transcribed in Hall (1993) as ⟦ʌ⟧, which I render for the sake of consistency with other varieties of German as [ɐ].

examples (Hall 1993: 92–93) reveal that there are two optional realizations of an underlying /ʀ/ in the context after a short vowel and before a fortis coronal obstruent. In (22) the coronal referred to here is word-final, and in (23) it is in the onset. The first column in both data sets shows that underlying /ʀ/ – indicated in the orthography as *r* – is realized either as the vowel [ɐ] or as the dorsal fricative [x]. The [x] in the examples listed below can occur after any short vowel, regardless of whether or not it is back (in 22a and 23a) or front (in 22b and 23b). Surface [x] in words like the ones in (22) and (23) must derive synchronically from /ʀ/ because that is the only source for the [ɐ] allophone present in the other optional variant.[7]

(22) [x] (from /ʀ/):

a.	[kʊɐs], [kʊxs]	Kurs	'course'
	[vɔɐt], [vɔxt]	Wort	'word'
	[mɑɐs], [mɑxs]	Mars	'Mars'
b.	[hɪɐʃ], [hɪxʃ]	Hirsch	'deer'
	[vɪɐt], [vɪxt]	Wirt	'host'
	[gəvʏɐts], [gəvʏxts]	Gewürz	'spice'
	[fɛɐs], [fɛxs]	Vers	'verse'

(23) [x] (from /ʀ/):

a.	[ʊɐ.tail], [ʊx.tail]	Urteil	'judgement'
	[vʊɐ.tsəl], [vʊx.tsəl]	Wurzel	'root'
	[fɔɐ.ʃən], [fɔx.ʃən]	forschen	'research-INF'
	[vɑɐ.tən], [vɑx.tən]	warten	'wait-INF'
b.	[fɛɐ.tɪç], [fɛx.tɪç]	fertig	'ready'
	[hɪɐ.ʃə], [hɪx.ʃə]	Hirsche	'deer-PL'
	[kʏɐ.tsɐ], [kʏx.tsɐ]	kürzer	'shorter'

The most significant examples presented above are the ones in (22b) and (23b), which show that velar [x] can occur after a front vowel. Regardless of how one analyzes the data, it is undeniably the case that LRGm is a dialect in which [x] and [ç] contrast on the surface after front vowels (represented by [ɪ ʏ ɛ] below). This contrast is illustrated with several of the examples given earlier, which I repeat in (24): In (24a) velar [x] (from /ʀ/) surfaces after [ɪ ɛ ʏ] and before a fortis coronal obstruent, and in (24b) palatal [ç] (from /x/) surfaces in the same context.

[7] In the context after a short vowel and before anything other than a coronal obstruent, /ʀ/ in the coda surfaces either as [ɐ] or as the lenis dorsal (uvular) fricative [ʁ], but not as [x], e.g. [mɑɐkt], [mɑʁkt] 'market' (*[mɑxkt]). An /ʀ/ in coda position after a long vowel surfaces obligatorily as [ɐ], e.g. [leːɐt] (*[leːxt], *[leːʁt]) 'teaches-3SG' (from /leːʀ-st/; cf. [leːʀən] 'teach-INF').

(24) Surface contrasts between [x] and [ç] after /ɪ ɛ ʏ/:

a.	[vɪxt]	Wirt	‘host’
	[gəvʏxts]	Gewürz	‘spice’
	[fɛxs]	Vers	‘verse’
b.	[lɪçt]	Licht	‘light’
	[gəʀʏçt]	Gerücht	‘rumor’
	[ʀɛçt]	recht	‘right’

On the basis of the surface contrasts in (24) one might be inclined to analyze the [ç] in words like [lɪçt] ‘light’ and the [x] in words like [vɪxt] ‘host’ both as phonemic, i.e. /lɪçt/ vs. /vɪxt/ and to deny that [ç] is an allophone of /x/. I reject that treatment because it fails to recognize that the fully transparent [ç] in [lɪçt] has a different synchronic source than the opaque [x] in [vɪxt]. In particular, the [ç] in the former type of example is the surface realization of underlying /x/ produced by Velar Fronting-1, whereas the opaque [x] in words like [vɪxt] is a sound that derives from the rhotic phoneme /ʀ/. Seen in this light, the examples in (22) and (23) show that Velar Fronting-1 is active but that it is opaque in examples like the ones in (22b) and (23b).

LRGm involves an interaction between Desonorization-2 in (19) and the process of laryngeal assimilation accounting for fortis vs. lenis alternations in examples like [leːst] ‘read-2PL’ with fortis [s] before fortis [t] vs. [leːzən] ‘read-INF’ with lenis [z] between vowels. The assimilation rule referred to above is stated linearly in (25), which differs only minimally from the eponymous assimilatory process posited in §3.6 for Upper Austria because the trigger for (25) is specified as a fortis coronal obstruent. It is argued in the original source to be required in addition to Final Fortition, which ensures that an obstruent is [+fortis] at the right edge of a syllable.

(25) Laryngeal Assimilation-2 (Lar Assim-2):

$$[-\textsc{son}] \rightarrow [+\textsc{fortis}] \;/\; \underline{\quad\quad} \begin{bmatrix} -\textsc{son} \\ +\textsc{fortis} \\ \textsc{coronal} \end{bmatrix}$$

In (26) I show how Desonorization-2 (Deson-2) feeds Laryngeal Assimilation-2 (Lar-Assim-2): The former creates |ʁ| and the latter |x|. Given the approach presupposed here, derived |x| in (26) has the same features as underlying /x/. As in Upper Austria (§3.6), the assumption is that [−nasal] is not present in |ʁ| or |x|.

(26)
$$\begin{array}{ccccc} /\text{ʀ}/ & \xrightarrow{\text{Deson-2}} & |\text{ʁ}| & \xrightarrow{\text{Lar Assim-2}} & |\text{x}| \\ \begin{bmatrix} +\textsc{cons} \\ +\textsc{son} \\ -\textsc{nasal} \end{bmatrix} & & \begin{bmatrix} +\textsc{cons} \\ -\textsc{son} \\ +\textsc{cont} \end{bmatrix} & & \begin{bmatrix} +\textsc{cons} \\ -\textsc{son} \\ +\textsc{cont} \\ +\textsc{fortis} \end{bmatrix} \\ | & & | & & | \\ [\textsc{dorsal}] & & [\textsc{dorsal}] & & [\textsc{dorsal}] \end{array}$$

The opaque LRGm examples presented above can be modelled in a rule-based approach consistent with the one proposed in Hall (1993). That treatment is illustrated in (27a): Desonorization-2 (Deson-2) feeds Laryngeal Assimilation-2 (Lar Assim-2), which itself counterfeeds Velar Fronting-1 (Vel Fr-1). This can be seen in the word [vɪxt] 'host' in (27a), which is intended to be representative of the data in (22b) and (23b). Significantly, Velar Fronting-1 applies at a point where the rhotic in that word has not yet been converted to [x] by Laryngeal Assimilation-2. If the latter were to feed Velar Fronting-1, then the [x] in words like [vɪxt] would incorrectly shift to the palatal [ç] after a front vowel, as in (27b). Note that the opaque system in (27a) is a specific example of the hypothetical Dialect G from Figure 2.8.

(27) a.

	/vɪʀt/	/lɪxt/
Vel Fr-1	—	lɪçt
Deson-2	vɪʁt	—
Lar Assim-2	vɪxt	—
	[vɪxt]	[lɪçt]
	'host'	'light'

b.

	/vɪʀt/	/lɪxt/
Deson-2	vɪʁt	—
Lar Assim-2	vɪxt	—
Vel Fr-1	vɪçt	lɪçt
	*[vɪçt]	[lɪçt]

Recall from §3.6 that the transparent relationship between the assimilation of laryngeal features (Laryngeal Assimilation-1) and Velar Fronting-1 as depicted above in (27b) is correct for Upper Austria, which corresponds to the hypothetical Dialect A from Figure 2.5.

Given the historical model introduced in §2.5, the modern-day system for LRGm in (27a) represents opacity at Stage 3, while the transparent realization in (27b) exemplifies Stage 2. Stage 1 (not depicted above) is a system with Desonorization-2 and Laryngeal Assimilation-2, but without Velar Fronting-1. That type of dialect is therefore one where /ʀ/ surfaces as [x] before a fortis coronal obstruent (e.g. /vɪʀt/⟶[vɪxt]) but where /x/ is realized as [x] even after a front vowel (e.g.

/lɪxt/⟶[lɪxt]). Although none of the sources cited in the present survey of German dialects explicitly describe such a dialect, the research referred to in §3.6 and §5.3.3 suggests that there are such systems among desonorizing SBav localities (e.g. Roitinger 1954: 203–207, Kranzmayer 1956: 124–127).

5.3.2 South Bavarian

The dialect described below is a variety of SBav originally spoken in the Ziller Valley (Zillertal), ca. 40 km to the east of Innsbruck in the Austria state of Tyrol (Footnote 3.3 and Footnote 15.8). In the year 1837 a number of those speakers – known as the Zillertaler Protestants ('Zillertaler Inklinanten') – emigrated to Prussia for religious reasons. Those emigrants settled in and around what was then known as Erdmannsdorf about 20km to the northwest of Hirschberg in the former province of Silesia (Siebs 1906; Figure 5.2).

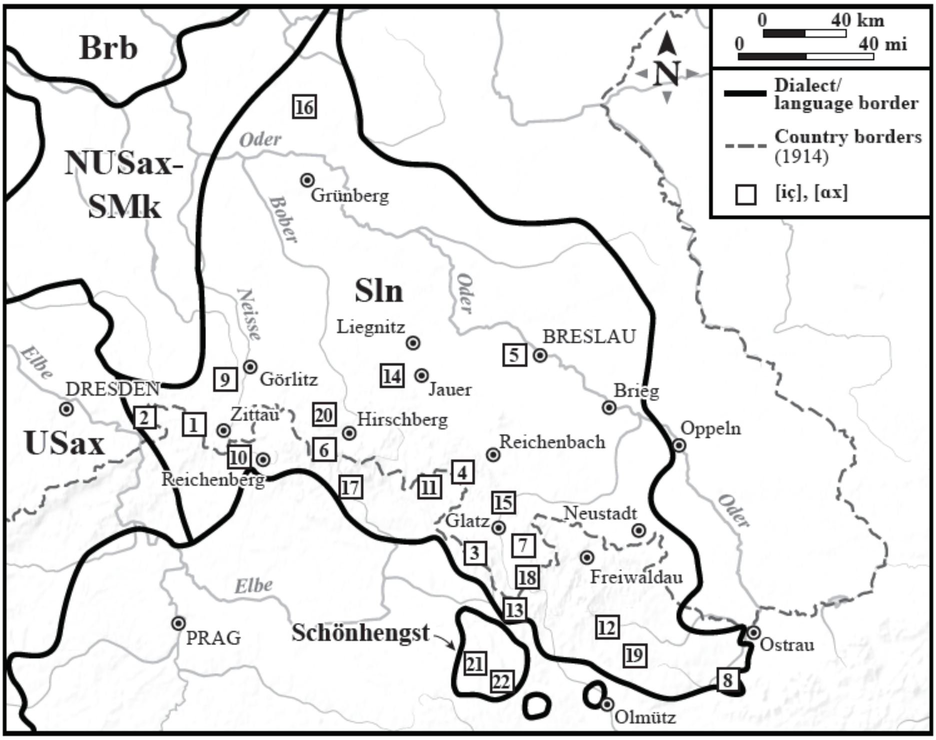
The source for the Erdmannsdorf dialect is Siebs (1906), who is known as the primary author of one of the most influential pronouncing dictionary of MoStGm (Siebs 1898, Siebs 1969). In contrast to other sources consulted in this book, Siebs (1906) is quite short (24 pages), and therefore the datasets discussed below exhibit several gaps. Nevertheless, the most significant generalizations (regarding /ʀ/ and velar fronting) are quite clear from the discussion in the original source.

Erdmannsdorf has front vowels (/iː ɪ yː ʏ eː ɛ øː œ/) and back vowels (/ʊ oː ɔ ɑː ɑ ə/) as well as a number of diphthongs, although the data with dorsal fricatives appear primarily after monophthongs. The two dorsal fricatives [x ç] (<WGmc ⁺[k] or ⁺[x]) stand in an allophonic relationship in postsonorant position, as in (28).[8]

(28) [x] and [ç] (from /x/):

a.	moxn̥	[mɔxn̩]	machen	'do-INF'	125
	āx	[ɑːx]	auch	'also'	125
	hôax	[hoːɑx]	hoch	'high'	114

[8] Siebs (1906: 110) is clear that his ⟦x⟧ and ⟦χ⟧ correspond to [x] and [ç] respectively, although he notes that ⟦χ⟧ is articulated in a slightly more retracted position ('weiter hinten') than [ç] in the standard language ("bühnendeutsch"). The fine-grained difference between ⟦χ⟧ and [ç] is a matter of phonetics and is therefore ignored below. Erdmannsdorf also possesses a dorsal affricate (⟦kx⟧), although Siebs (1906: 125) does not discuss whether or not that sound has a palatal allophone in the neighborhood of front vowels, as in Rheintal (§3.4). The etymological palatal [ʝ] is restricted in its distribution to word-initial position, and there is no [ɣ].



Map 5.2: Silesian (Sln). 20 is a variety of South Bavarian, and 21 and 22 are a German-language island. Squares indicate postsonorant velar fronting. 1=Michel (1891), 2=Meiche (1898), 3=Pautsch (1901), 4=Hoffmann (1906), 5=von Unwert (1908), 6=Graebisch (1912) (Kreis Hirschberg), 7=Graebisch (1912) (Alt-Waltersdorf), 8=Wenzel (1919), 9=Giernoth (1917), 10=Kämpf (1920), 11=Festa (1925), 12=Rieger (1935), 13=Weiser (1937), 14=Halbsguth (1938), 15=Blaschke (1966), 16=Messow (1965), 17=SchlSA (Hohenelbe), 18=SchlSA (Grulich), 19=SchlSA (Bärn), 20=Siebs (1906), 21=Janiczek (1911), 22=Benesch (1979).

b.	îχ	[iːç]	ich	'I'	125
	küχn̥	[kʏçn̩]	Kuchen	'cake'	115
	töχtr̥	[tœçtʀ̩]	Töchter	'daughters'	122
	kȫχ	[køːç]	Brei	'porridge'	125
	kšleχt	[kʃlɛçt]	schlecht	'bad'	125
c.	milχ	[mɪlç]	Milch	'milk'	125

As indicated above, [x] occurs after a back vowel (in 28a) and [ç] after a coronal sonorant (in 28b,c).[9] There are various gaps (e.g. no dorsal fricatives after [ɪ yː ʊ]), which I interpret as accidental in light of the brevity of the source.

Words with velar [x] surfacing after a front vowel are common. The generalization is that the [x] in those examples has a different synchronic (and diachronic) source than the transparent [x ç] in (28), namely /ʀ/.

At several points in his article, Siebs (1906) discusses the realization of /ʀ/ in coda position ("Auslaut"). In general, /ʀ/ either deletes or is vocalized in that context (Siebs 1906: 119; 123). However, the author adds that the realization of the rhotic is [x] word-internally before a consonant or in final position. ["Neuhochd. r … im Inlaute vor Konsonanten und im Auslaute erscheint … als x (ch) …".] In the context before a consonant, /ʀ/ is pronounced as [x] before [s] or [st]. ["rs erscheint als x, rst als xt"]. Recall from §3.6 that the historical change from the rhotic phoneme to a fortis dorsal fricative before sounds like [t] is well-documented in a number of varieties of Bav.

The data presented in (29) illustrate the realizations of /ʀ/ in coda position, as described in the preceding paragraph. The sound in question is reflected as *r* in the MoStGm orthography in the third column. An item showing the vocalization of /ʀ/ (=⟦a⟧) is presented in (29a). Examples in which /ʀ/ surfaces as [x] after a back vowel and before a fortis coronal obstruent ([t] or [ts]) can be seen in (29b). Erdmannsdorf /ʀ/ also surfaces as [x] in coda position even if a consonant does not follow, as in (29c). The most significant examples are ones in which /ʀ/ surfaces as velar [x] after a front vowel, as in (29d). The post-front vowel [x] in some examples has an alternate with [ʀ], as in (29e).[10]

[9] As in Maienfeld (§3.3), there are also [x]~[ç]~[h] alternations (from /h/) in which [x] and [ç] have a transparent distribution. I ignore these data below. As in LRGm, Erdmannsdorf has a palatal quasi-phoneme after a rhotic.

[10] A peripheral point concerns the realization of w as in several items listed in (29). Siebs (1906: 109) observes that the sound in question is articulated with hardly any noticeable frication and appears to be pronounced in onset position as [b]. (29d) demonstrates that -*ig* surfaces as [iːç] and not as the expected [iːk], which is the reflex of that suffix in UGm. Siebs (1906: 124) notes that his informants pronounced the *g* in -*ig* as [k] or as [ç]. Given the examples in (29c), it is not clear why the rhotic in [fiːʀ] in (29e) fails to surface as [x].

(29) Realizations of coda /ʀ/:

a.	vôa	[foːɐ]	vor	'before'	119
b.	wuxt	[bʊxt]	wurde	'became-PRET'	120
	wôxt	[boːxt]	Wort	'word'	114
	šwôxts	[ʃboːxt]	schwarz	'black'	120
	hêaxt	[heːɑxt]	hört	'hears-3SG'	114
	hêaxts	[heːɑxts]	Herz	'heart'	123
	êaxt	[eːɑxt]	erst	'only'	123
	bîəxtə	[biːəxtə]	Bürste	'brush'	123
c.	fôəx	[foːəx]	vor's	'before it'	123
	ihr	[iəx]	ihr	'you-PL'	120
	wû̈əx	[byːəx]	Wurst	'sausage'	115
d.	fextîχ	[fɛxtiːç]	fertig	'ready'	117
	fêxt	[feːxt]	fährt	'goes-3SG'	112
e.	fîr	[fiːʀ]	vier	'four'	113
	fîxtə	[fiːxtə]	vierte	'fourth'	113

The critical reader may call into question that the [x] in (29) derives from /ʀ/. Recall from §5.3.1 that the /ʀ/ in similar data from LRGm is justified on the basis of the optional pronunciation with [ɐ], whose only synchronic source is /ʀ/. Siebs does not say explicitly that the same kind of free variation is possible for his speakers, but he does provide examples like the ones in (29e) that justify /ʀ/.

The most important examples are the ones in (29), which reveal the occurrence of velar [x] after a front vowel. Erdmannsdorf [x] and [ç] contrast on the surface after front vowels. That contrast is illustrated with several of the examples presented above, which I repeat in (30): In (30a) velar [x] (from /ʀ/) surfaces in the coda after [iː ɛ], and in (30b) palatal [ç] (from /x/) surfaces in the same context.

(30) Contrasts between [x] and [ç] after /iː/ and /ɛ/:

a.	fîxtə	[fiːxtə]	vierte	'fourth'
	fextîχ	[fɛxtiːç]	fertig	'ready'
b.	îχ	[iːç]	ich	'I'
	kšleχt	[kʃlɛçt]	schlecht	'bad'

Opaque examples in which [x] surfaces after a front vowel can be accounted for if Final Fortition counterfeeds Velar Fronting-1, cf. Rhoden (§5.2). Counterfeeding opacity is evident in the word [fiːxtə] 'fourth' in (31a), which is intended to be representative of all of opaque examples. Significantly, Velar Fronting-1 (Vel

Fr-1) applies at a point where the rhotic in that word has not yet been converted to [x] by Final Fortition (Fnl For). If the latter were to feed Velar Fronting-1, then the [x] in words like [fiːxtə] would incorrectly shift to the palatal [ç] after a front vowel, as illustrated in (31b). Note that the correct output in (31a) is obtained if /ʀ/ undergoes Desonorization-1 (Deson-1), thereby feeding Final Fortition.

(31) a.

	/fiːʀ-tə/	/iːx/
Vel Fr-1	—	iːç
Deson-1	fiːʁtə	—
Fnl For	fiːxtə	—
	[fiːxtə]	[iːç]
	'fourth'	'I'

b.

	/fiːʀ-tə/	/iːx/
Deson-1	fiːʁtə	—
Fnl For	fiːxtə	—
Vel Fr-1	fiːçtə	iːç
	*[fiːçtə]	[iːç]

(31a) exhibits the underapplication of Velar Fronting-1: The fortis velar fricative in the phonetic representation potentially forms the input to Velar Fronting-1 because it stands after a front vowel. The opaque system in (31a) exemplifies the hypothetical Dialect G from Figure 2.8.

The historical progression from transparency to opacity is essentially the same as the one proposed earlier for LRGm. Thus, the opaque Erdmannsdorf system in (31a) represents Stage 3, while the transparent system in (31b) illustrates Upper Austria (§3.6). Not depicted above is Stage 1, where Velar Fronting-1 was absent.

The opaque system in (31a) for Erdmannsdorf could not have arisen under the influence of Sln dialects spoken in the general vicinity. An examination of the sources for Sln reveals that there is no evidence for contact-induced change. This point is clear from the maps in the linguistic atlas for Silesia (SchlSA) for words with /r/ in the coda (e.g. Map 6 for *Kirche* 'church' and Map 38 for *Tür* 'door'). The rhotic in those words is most commonly realized on those maps as the coronal consonant [r], or it the vocalized-r; however, no variant with [x] (or [ç]) is attested. The same conclusion is drawn by all of the sources consulted for Sln. The following three examples are significant because they all reveal that [x] and [ç] have a transparent distribution.

Halbsguth (1938) describes the Sln dialect once spoken in Bremberg (Footnote 5.2). He writes that the rhotic surfaces as an untrilled tongue-tip-r ('ein ungerolltes Zungenspitzen-r') in word- and syllable-initial position (Halbsguth 1938: 29–30). In the coda, the sound is vocalized after a long vowel, but it is retained as [r] after a short vowel in coda position before velars and labials. In coda position after a short vowel, [r] tends to delete if the following consonant is a coronal. No mention is made of the realization of data like the ones in (30b-e). In

Bremberg, the palatals [ç ʝ] and velars [x ɣ] are the realization of the corresponding velars /x ɣ/ after a front vowel and back vowel respectively, but there does not appear to be an opaque [x] or an opaque [ɣ].

Pautsch (1901) provides a historical grammar of the Sln variety once spoken in Kieslingswalde (Footnote 5.2). On the basis of his description of the phonetics of consonants (p. 12), the one rhotic is a coronal tongue-tip sound ('Zungenspitzen-r') which vocalizes in coda position. The dialect has the four dorsal fricatives [x ɣ ç ʝ], but those sounds have a transparent distribution (i.e. palatals after coronal sonorants and velars after back vowels). There do not appear to be cases involving an opaque [x] or [ɣ].

Von Unwert (1908) is a descriptive grammar of the Sln dialect as it was spoken throughout the Prussian province of Silesia (Footnote 5.2) and the neighboring areas of the Austro-Hungarian Empire (in modern-day Czech Republic). According to that source (pp. 33–34), [r] is a coronal sound articulated on the tongue-tip ('Zungenspitze') in onset position. In coda position that sound tends to either delete or vocalize before coronal consonants, but no mention is made of a [x] realization (as in 29b-e). The dialect described by von Unwert has the velar fricative [x] and the two palatal fricatives [ç] and [ʝ], but those sounds all have a transparent distribution (von Unwert 1908: 52–54): [ç] and [ʝ] surface after a front vowel or coronal consonant ([l] or [r]) and [x] after a back vowel. There is no evidence for an opaque [x].

5.3.3 Areal distribution of opacity resulting from desonorization

The two case studies discussed above have in common that /ʀ/ surfaces as the velar fricative [x] even in the context after front vowels. It is interesting to observe that the same set of facts obtain in two places (in and around Düsseldorf and Erdmannsdorf) separated by several hundreds of kilometers.

The realization of the consonantal rhotic ([r]/[ʀ]) as the velar fricative [x] has been discussed at length in the literature on German dialectology and phonetics. A recent assessment of the state of that research can be found in NOSA: 309–321. According to that source the change [r]/[ʀ] > [x] is most prevalent in the Rpn and MFr dialect areas, but it is also attested throughout various places in North Germany. NOSA also concludes that the change typically occurs in the context after a short vowel and before fortis (voiceless) coronal obstruents, or some subset thereof (e.g. [t]). The data from North Germany discussed in NOSA reveal that the change is most common in the context after short back vowels, although the percentages listed (p. 319) make it clear that [x] can also occur in the context after a short front vowel. Since the areas in North Germany discussed in NOSA have velar fronting, sequences like [ɪx] (from /ɪʀ/) are therefore opaque.

In Table 5.2 I cite some of the sources known to me which have documented the change [r]/[ʀ] > [x] in German dialects. These sources have in common that they either state explicitly that the change occurs in the context after a short vowel and before a coronal obstruent (or some subset thereof) or that context is implied by the examples they give. Since velar fronting is prevalent in all of the areas listed below any realization of [r]/[ʀ] as [x] after a front vowel implies an opaque system like the ones discussed above. Some of the sources give such opaque examples, while others only cite data in the context after a short back vowel.[11]

Table 5.2: Desonorization ([r]/[ʀ] >[x])in German dialects

Source	Area
Runschke (1938: 102)	Berlin
Meyer-Eppler (1959: 248)	Rpn/West Germany
Niekerken (1963: 171–173)	Area south of Hannover
Siebs (1969: 86)	North Germany
Kohler (1977: 170)	Rhineland
Wängler (1983: 157–158)	North Germany
Macha (1991: 145–149)	Siegburg (Rpn)
Hall (1993)	Lower Rhine (Rpn)
Kreymann (1994: 73–77)	Erp (Erftstadt) (Rpn)
Lauf (1996: 213)	Eph dialect area
Cornelissen (2002: 298–300)	Rheinland (Rpn)
Elmentaler (2012: 108ff.)	Hannover
Möller (2013: 98; 172f.)	Bonn (Rpn)

The occurrence of desonorization throughout the Rhineland (Rpn/MFr) is also documented spatially in several maps. One example already cited in Table 5.2 can be found in Cornelissen (2002). Two linguistic atlases with similar maps are

[11] One of the works listed in Table 5.2 (Niekerken 1963: 171) observes that the change from rhotic to [x] occurs after the vowels [ɑ] and [o] and before [t], e.g. ⟦gɑxtn̩⟧ 'garden'. By contrast, in the context after front vowels or [u], an epenthetic (back) vowel is inserted before the [x], e.g. ⟦vi̯ᵒxt⟧ 'host' (cf. MoStGm [viʀt], LRGm [vɪxt]). Epenthesis appears to be a strategy speakers adopt to avoid an opaque output. To the best of my knowledge no other German dialect is attested which involves a repair to avoid opacity.

AAS (for *Garten* 'garden' in Volume 2 : 197) and ADA (for *Karte* 'map' and *Sport* 'sports').

Recall from §5.3.2 that the context for desonorization in Erdmannsdorf is not the same as the one attested in the places listed above. In particular, desonorization also occurs in the context (A) after a long vowel and before a fortis coronal obstruent or (B) in word-final position. The following three studies document either (A) or (B) in German dialects. Since velar fronting is active in all of these places the occurrence of derived [x] after a front vowel implies opacity.

In his study of the CGm varieties spoken in Manderfeld and Wallerode (to the north(east) of St. Vith on Footnote 5.1), Hecker (1972: 67–68) writes:

> Im Auslaut kann /r/ als [x] realisiert werden, zum Beispiel /taːrt/ [taːxt] 'Butterbrot' … Ein auf /r/ zurückgehendes [x] kann auch nach palatalem Silbenkern vorkommen.
>
> 'In the coda /r/ can be realized as [x], for example /taːrt/ [taːxt] 'bread and butter' … A [x] deriving from /r/ can also occur after a front vowel'.

The example shows that desonorization occurs in context (A). No examples are provided for the opaque sequences alluded to in this quote.

A more explicit statement concerning opacity can be found in Freund (1910: 97), who makes the following observation concerning the realization of /ʀ/ as a dorsal fricative in the variety of CHes spoken in Marburg (Footnote 7.1). The examples discussed under case (2) in this quote differ from the data in other case studies in this section because they show that the contrast between /ʀ/ and /ɣ/ (=⟦ɣ⟧) is neutralized to [ɣ] in onset position. The second example under case (Table 5.2) documents context (A).

> 'There is no difference in the pronunciation of (1) *Wacht* and *ward* [ʋaxt], *mocht* and *Mord* [moxt], *Wucht* and *wurd'* [ʋuxt] (fortis x); (2) *behagt* and *behaart* [bəhaːxt (lenis x); and (3) *Wagen* and *waren* [vaːɣn], *behagen* and *beharren* [bəhaːɣn], *saugen* and *sauren* [saoɣn] …'.

The important point regarding Freund's treatment of Marburg /ʀ/ is that his data show the same kind of underapplication opacity as in LRGm and Erdmannsdorf. Examples from Freund (1910: 97) with a derived [x] after a front vowel include [hexʃn] 'rule-INF' (cf. MoStGm [hɛʀʃən]), [fexs] 'verse' (cf. MoStGm [fɛʀs]), and [kixçə] 'church' (cf. MoStGm [kɪʀçə]).

The final example is Müller (1958b), which contains a brief description of the consonants and vowels in Kassel (NHes), including a phonetically-transcribed text from a native speaker (Footnote 7.1). It is clear from the transcriptions that the data are essentially the same as the ones described above for Marburg. Thus, /ʀ/ is realized as [x] after both back and front vowels, e.g. *erst* 'only' [ɛxst] (cf. MoStGm [ɛʀst]) and *mehr* 'more' [meːx] (cf. MoStGm [meːɐ] from /meːʀ/). The second example illustrates context (B). Significantly, the two examples cited here demonstrate opacity.

5.4 An apparent case of overapplication opacity

The dialects discussed above have in common that they involve underapplication. In particular, all of those dialects possess a velar fricative derived from some other sound (by Rule W from Table 2.7), but that derived velar fricative (|x|) fails to serve as a target segment for velar fronting. Rule W therefore counterfeeds velar fronting synchronically.

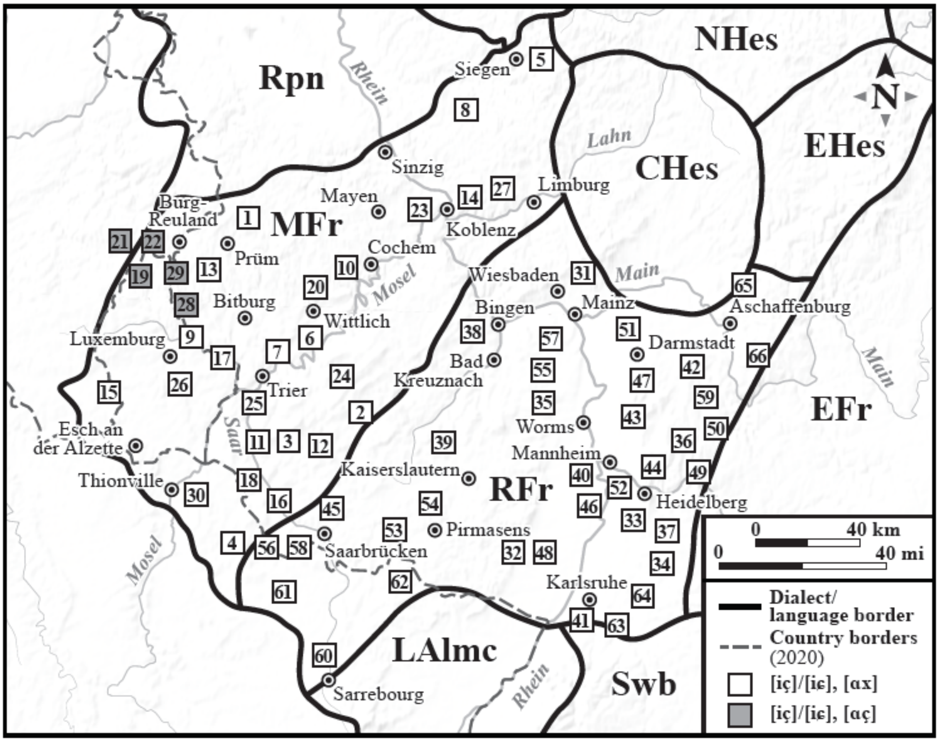
Although the underapplication of velar fronting in the synchronic phonology is well-attested, the overapplication of that same process is not. There is one potential example known to me of a synchronic process counterbleeding velar fronting thereby resulting in overapplication opacity. Although that type of example is very well-attested in German dialects, I demonstrate that there is a plausible alternative which does not require velar fronting to be counterbled by another process in the synchronic grammar.

Hommer (1910) describes a MFr dialect spoken in the northern part of Westerwald in the German state of Rhineland-Palatinate (Rheinland-Pfalz). Hommer's grammar focuses on the community of Sörth (Footnote 5.3).

It is clear from the material in Hommer (1910) that Sörth possesses the two underlying velar fricatives /x ɣ/, which have palatal allophones [ç ʝ] after any front vowel (in 32c,d) or (coronal) liquid (in 32e). After any full back vowel /x ɣ/ surface as velars (in 32a,b).

(32) Postsonorant [x ɣ] and [ç ʝ] (from /x ɣ/):

a.	šdrux	[ʃtrux]	Strauch	'shrub'	22
	kōxən	[koːxən]	Kuchen	'cake'	22
	kǫxən	[kɔxən]	kochen	'cook-INF'	22
	mɑxən	[mɑːxən]	machen	'do-INF'	22
b.	fuɣəl	[fuɣəl]	Vogel	'bird'	25
	ōɣən	[oːɣən]	Augen	'eyes'	25
	frǫɣən	[frɔːɣən]	fragen	'ask-INF'	25
	grɑɣən	[grɑːɣən]	Kragen	'collar'	25



Map 5.3: Moselle Franconian (MFr) and Rhenish Franconian (RFr). White squares indicate assimilatory postsonorant velar fronting, and the shaded squares represent nonassimilatory postsonorant velar fronting. 1=Büsch (1888), 2=Baldes (1896), 3=Fuchs (1903), 4=Tarral (1903), 5=Reuter (1903), 6=Ludwig (1906), 7=Thomé (1908), 8=Hommer (1910), 9=Engelmann (1910), 10=Wimmert (1910), 11=Thies (1912), 12=Scholl (1912), 13=Meyers (1913), 14=Bach (1921), 15=Bertrang (1921), 16=Lehnert (1926), 17=Palgen (1931), 18=Pallier (1934), 19=Bruch (1952), 20= Bethge & Bonnin (1969), 21=Hecker (1972), 22=Cajot & Beckers (1979), 23=Mattheier (1987), 24=Reuter (1989), 25=Peetz (1989), 26=Gilles (1999), 27=Féry (2017), 28=MRhSA (Dahnen), 29=MRhSA (Lützkampen), 30=ALLG (Elzange), 31=Reis (1892), 32=Heeger (1896), 33= Lenz (1900), 34= Wanner (1907), Wanner (1908), 35=Haster (1908), 36=Wenz (1911), 37=Reichert (1914), 38=Martin (1922), 39=Christmann (1927), 40= Krell (1927), 41=Lauinger (1929), 42=Freiling (1929), 43=Seibt (1930), 44=Treiber (1931), 45=Kuntze (1932), 46=Waibel (1932), 47=Grund (1935), 48=Bertram (1937), 49=Kilian (1951), 50=Bauer (1957), 51=Keller (1961) (Darmstadt), 52=Liébray (1969), 53=Castleman (1975), 54=Karch (1980), 55=Karch (1981), 56=Steitz (1981), 57=Post (1987), 58=Pützer (1988), 59=Durrell & Davies (1989), 60=ALLG (Langatte), 61=ALLG (Laning) 62=ALLG (Schorbach), 63=SNBW (Remschingen), 64=SNBW (Bretten), 65=SUF (Schneppenbach), 66=SUF (Wintersbach).

	c.	sīχ	[si:ç]	siech	‘ailing’	22
		liχ	[lɪç]	Leiche	‘body’	22
		kyχ	[kyç]	Küche	‘kitchen’	13
		šlēχt	[ʃle:ç]	schlecht	‘bad’	10
		eχ	[eç]	ich	‘I’	22
		blę̄χ	[blɛç]	Blech	‘tin’	22
		sø̄χən	[sø:çən]	suchen	‘search-INF’	10
	d.	ijəl	[ɪʝəl]	Igel	‘hedgehog’	24
		flyjəl	[flyʝəl]	Flügel	‘wing’	24
		fējən	[fe:ʝən]	fegen	‘sweep-INF’	24
	e.	foljən	[fɔlʝən]	folgen	‘follow-INF’	24
		bɑrjən	[bɑrʝən]	borgen	‘borrow-INF’	24

The distribution of postsonorant dorsal fricatives in (32) is captured with Velar Fronting-1.

The crucial set of examples involves the occurrence of palatal [ç] after schwa in word-final (coda) position, as in (33). The corresponding velar ([x]) is not attested after [ə]. The consonant preceding schwa is a coronal liquid, namely [r] (in 33a) or [l] (in 33b), but there are no words ending in [əç] preceded by anything other than [l] or [r]. The sound underlying [ç] is either /x/ (e.g. in the first word in 33a) or /ɣ/ in the remaining words, e.g. [bɑləç] in (33b), in which [ç] alternates with [ʝ] in [bɑlʝən] ‘scrap-INF’ (Hommer 1910: 5). Alternations involving [ʝ] and [ç] are captured with Final Fortition (in 8).

(33)	a.	kęrəχ	[kɛrəç]	Kirche	‘church’	22
		sɑrəχ	[sɑrəç]	Sorge	‘sorrow’	11
		węrəχ	[vɛrəç]	Werg	‘oakum’	22
	b.	bɑləχ	[bɑləç]	Balg	‘brat’	24

The sequence [əç] appears to involve overapplication because palatal [ç] derives from velar /x/ after a vowel (schwa) that is not front.

The schwa in (33) is a synchronically epenthetic vowel. Hommer himself sees schwa in examples like the ones in (33) as the product of epenthesis (Svarabhakkti). The data in the original source indicate that schwa is epenthesized after a coronal liquid and before a coda labial or velar. Two examples with an epenthetic schwa after a liquid and before a coda labial are presented in (34a). Many words given in the original source are transcribed with and without schwa, as in (34b), indicating that the epenthesis process is optional. The examples in (34c) and (34d) show that the schwa after a liquid and before the dorsal fricative [ç] behaves precisely like the epenthetic schwa in (35a,b).[12]

(34)	a.	haləf	[haləf]	halb	'half'	26
		karəf	[karəf]	Korb	'basket'	26
	b.	halm, haləm	[halm], [haləm]	Halm	'blade'	5
		kalk, kalək	[kalk], [kalək]	Kalk	'lime'	5
		šarf, šarəf	[ʃarf], [ʃarəf]	scharf	'sharp'	5
	c.	bęrχ, bęrəχ	[bɛrç], [bɛrəç]	Berg	'mountain'	8, 24
		bęrjən	[bɛrʝən]	in der Grube arbeiten 'work-INF in the pit'		8
	d.	balχ, baləχ	[balç], [baləç]	Balg	'brat'	5, 24
		baljən	[balʝən]	balgen	'scrap-INF'	5

Examples like the ones in (34c,d) indicate that there is no contrast between word-final sequences like [ləç] and word-final [lç]. This suggests that the words in question have no schwa in the underlying representation and that it is inserted by an optional rule. The way in which Schwa Epenthesis is analyzed is not important for present purposes; I simply state the process in its prose form in (35) for transparency:

(35) Schwa Epenthesis: Insert [ə] between a liquid and a labial or dorsal coda consonant.

The epenthesis of schwa between a liquid and a labial or dorsal consonant is not restricted to Sörth, nor is it a defining property of MFr in general. As noted by Schirmunski (1962: 401), Schwa Epenthesis between a liquid and labial/velar can be observed to a certain degree in all HGm dialects. ("Die Erscheinung hat alle Hochdeutschen Dialekte erfasst ..."). I do not attempt to provide a survey of specific varieties of German dialects with (35); however, I provide a selection of ten WCGm and UGm varieties in Table 5.3 in which the sources state explicitly that epenthesis (Svarabhakkti) is present in examples like the ones in (33) and (34). For a discussion of the presence of (35) in German dialects the reader is referred to Auer (1997).[13]

The pattern of epenthesis in Sörth and in the dialects in Table 5.3 is also essentially the same as in Dutch (Trommelen 1984: 77–79, Booij 1995: 127–128, van

[12] Although Hommer does not say so explicitly, the pattern of epenthesis described above only holds between a liquid and a noncoronal; hence, a word like *alt* 'old' (Hommer 1910: 23) is pronounced [alt] and not [alət]. Hommer provides some examples in which a schwa appears between a nasal and a noncoronal (e.g. [hanəf] 'hemp') and between a liquid and a coronal

Table 5.3: Selection of UGm and WCGm varieties attested with Schwa Epenthesis (=35)

Place/Region	Dialect	Source
Wachbach	EFr	Dietzel (1908)
Suhl	EFr	Kober (1962)
Oberschopfheim	LAlmc	Schwend (1900)
Rheinbischofsheim	LAlmc	Weik (1913)
Sehlem	MFr	Ludwig (1906)
Arel	MFr	Bertrang (1921)
Zaisenhausen	RFr	Wanner (1907, 1908)
Saarbrücken	RFr	Kuntze (1932)
Erftgebiet	Rpn	Münch (1904 [1970])
Schelsen	Rpn	Greferath (1922)

Oostendorp 2000). Dutch words showing the (optional) epenthesis of schwa between a liquid and a final noncoronal (from Booij 1995) include *arm* 'arm' and *elf* 'eleven', which can surface as [ɑrəm] and [ɛləf] respectively. By contrast, there is no schwa between a liquid and a coronal obstruent, e.g. *halt* [hɑlt] 'stop-IMP SG'.

One approach to the data in (33) – which I reject – requires Schwa Epenthesis to counterbleed Velar Fronting-1 (Vel Fr-1), as in (36a). This is a counterbleeding relationship because the reverse ordering (in 36b) requires Schwa Epenthesis to bleed Velar Fronting-1.

(36) Counterbleeding order in Moselle Franconian (rejected):

nasal (e.g. [gɑrən] 'yarn'). These complications do not bear on the present analysis.

[13] Auer argues that the sound transcribed as schwa ([ə]) in (34) is not the product of epenthesis. One of his reasons for questioning a traditional phonological rule of insertion is that schwa in data like the ones in (34) can be seen as a consequence of the mistiming of articulatory gestures; see Browman & Goldstein's (1992) framework of Articulatory Phonology. The purpose of this section is not to defend a traditional rule of epenthesis but instead to discuss the extent to which the data in (34) illustrate the opacity of velar fronting. Seen in this light, the treatment for Sörth I suggest below can be modelled in a number of frameworks, including the ones Auer discusses.

a.		/kɛrx/	b.		/kɛrx/
	Vel Fr-1	kɛrç		Schwa Epenthesis	kɛrəx
	Schwa Epenthesis	kɛrəç		Vel Fr-1	—
		[kɛrəç]			*[kɛrəx]
		‘church’			

(36a) implies that a phonetic representation like [kɛrəç] is opaque on the surface because it involves the overapplication of Velar Fronting-1. The aforementioned process overapplies in (36a) because it can only create a palatal after a front ([coronal]) vowel; since schwa is not a [coronal] vowel, a surface form like [kɛrəç] shows that Velar Fronting-1 also appears to apply in a context not specified in the structural description of the rule.

There is a plausible alternative analysis for Sörth that eschews opacity. I argue that the epenthetic schwa is a surface front vowel because it occurs after a front consonant. That derived front vowel is created by Schwa Fronting-2 in (37), which spreads the feature [coronal] rightward from a liquid to schwa. Recall from §3.4 that an eponymous process was posited for Rheintal to account for the realization of dorsal fricatives and affricates as palatal in the context after diphthongs ending in schwa if that schwa is preceded by a front vowel. The difference between Schwa Fronting-1 and Schwa Fronting-2 is the set of triggers: For the former it is front vowels and for the latter it is liquids. For some discussion of both processes of schwa fronting the reader is referred to §12.8.1.

(37) Schwa Fronting-2:

$$\begin{bmatrix}+\textsc{son}\\-\textsc{nas}\end{bmatrix} \quad \begin{bmatrix}-\textsc{cons}\\+\textsc{son}\end{bmatrix}$$

$$[\textsc{coronal}]$$

The target for Schwa Fronting-2 is placeless front vowel (=/ə/; recall §2.2.3). When that assimilation applies a derived front vowel is created which bears the three features [−consonantal, +sonorant, coronal] but no others. That synchronically derived feature complex is distinct from the features characterizing all underlying front vowels, which bear specification for either height features, the tenseness feature, or both.[14]

[14]The target must be a placeless vowel. If a full back vowel occurs after a liquid and before /x/, then Schwa Fronting-2 fails to apply; cf. [ʃtrʊx] ‘shrub’ from (32a), which surfaces with [x] and not [ç]. The [coronal] feature cannot progressively assimilate from /r/ to /ʊ/ in that type of example because /ʊ/ is a full back vowel, which by definition bears a place feature (e.g. [dorsal]).

Schwa Epenthesis feeds Schwa Fronting-2, thereby creating the derived front vowel, which in turn feeds Velar Fronting-1 (Vel Fr-1). The transparent system depicted in (38) is a specific example of the hypothetical Dialect B from Figure 2.5.

(38)

	/kɛrx/
Schwa Epenthesis	kɛrəx
Schwa Fronting-2	kɛrə̟x
Vel Fr-1	kɛrə̟ç
	[kɛrə̟ç]
	'church'

The advantage of the present treatment is that it is fully transparent and therefore does not rely on an otherwise unattested type of (synchronic) opacity, namely the overapplication of velar fronting.

One conceivable objection to the transparent treatment in (38) is that the schwa is not transcribed in Hommer (1910) as a fronted vowel. However, an examination of the other sources for dialects with Schwa Epenthesis in Table 5.3 reveals that the epenthetic schwa in the context between a liquid and a palatal fricative is typically transcribed with a distinct front vowel symbol from the schwa in other contexts. As a representative example, consider the EFr dialect spoken in Suhl (Kober 1962; Footnote 3.4). In that dialect the only (synchronic) target for velar fronting is /x/, which surfaces as [ç] after any front vowel and [x] after any back vowel. As in a number of case studies cited earlier, Kober's symbols for the fortis palatal and velar fricatives are ⟦χ⟧ and ⟦x⟧ respectively, as in (39a,b). It is clear from the material presented in the original source that there is an epenthetic schwa between a liquid and /x/, as in (39c). The additional data in (39d) illustrate that – in contrast to Sörth – epenthesis is not triggered by a labial or velar. The important point is that the epenthetic schwa is transcribed in Kober (1962) as ⟦ɩ̣⟧, which itself is not a phonemic vowel, but it differs minimally from the author's (phonemic) high front unrounded lax vowel ⟦ɩ⟧, e.g. ⟦dɩχd⟧ 'tight'. The item listed in (39a) is significant because it indicates Kober has the symbol for schwa (⟦ə⟧), which is present if not inserted between a liquid and velar. The IPA transcriptions in (39) are the ones I assume to be correct. Kober's ⟦ɩ̣⟧ is my [ə̟].

(39)

a.	wīχə	[viːçə]	Wiege	'cradle'	84
b.	bōx	[boːx]	Bogen	'bow'	84
c.	so̜rɩ̣χ	[sɔrə̟ç]	Sorge	'sorrow'	70
	folɩ̣χ	[folə̟ç]	folgen	'follow-INF'	84

d.	bɑlg	[bɑlg]	Balken	'beam'	87
	wɑrm	[vɑrm]	warm	'warm'	70

Although Hommer (1910) fails to provide a separate phonetic symbol for a fronted schwa, I contend that his transcription was broad and was therefore not intended to capture a fine-grained distinction between two types of schwa. All of the sources listed in Table 5.3 with the exception of Münch (1904 [1970]) and Greferath (1922) transcribe the epenthetic schwa differently than the underlying schwa.[15]

Since velar fronting (regardless of dialect) is a phonological process and not a phonetic one (Figure 2.7) the implication in (38) is that Schwa Fronting-2 is also phonological and not phonetic. If this is correct then one would expect there to be dialects with some version of velar fronting and some version of schwa epenthesis but without Schwa Fronting-2. In that type of dialect palatals would surface after a front vowel (e.g. [siːç] 'sick' in 32c), velars after a full back vowel (e.g. [ʃtrux] 'shrub' in 32a) and after the epenthetic schwa (e.g. [kɛrəx] 'church'). Thus, Schwa Epenthesis would bleed velar fronting, as in (36b). That type of dialect is extremely rare; in fact, the present survey has only uncovered one, namely the town of Langenlutsch in the former German-language island of Schönhengst in the Czech Republic (Janiczek 1911; Footnote 5.2). That dialect is discussed in §15.3.

The reason dialects like the one described by Janiczek (1911) are so rare can be attributed to the geographic spread of velar fronting. My survey reveals that – with only a small number of exceptions – some version of postsonorant velar fronting is active in virtually all present-day German dialects (see Chapter 11). Given the extent to which velar fronting predominates geographically it is difficult – although not impossible – to find a non-velar fronting variety like the one documented by Strohmaier (1930).

5.5 Discussion

5.5.1 Rule reordering and domain narrowing

The diachronic treatment of underapplication opacity proposed in this chapter is viewed below in the context of domain narrowing (e.g. Bermúdez-Otero 2007, 2015, 2007, Ramsammy 2015). According to that theory, rules are phonologized

[15] On the basis of some of the works cited in Table 5.3 it appears that the fronted schwa occurs between a liquid and a palatal (e.g. [ç]) or velar (e.g. [k]). This suggests that the target segment in Schwa Fronting-2 must be followed by a [dorsal] consonant. Since my treatment is not affected by this modification I do not discuss this matter further.

at the end of the grammar and then gradually work their way up into smaller domains. As described in §2.2.1, many phonologists argue that the phonological component (Figure 2.7) is subdivided into domains of various sizes to which rules are assigned. For example, in Stratal Optimality Theory a distinction is drawn between phrase level, word level, and stem level rules. Examples from American English for those three domains were discussed in that earlier section, i.e. Trisyllabic Laxing (stem level), n-Deletion (word level), and Flapping (phrase level).

Domain narrowing postulates that rules work their way up (diachronically) from the lowest level (i.e. the largest domain) to higher levels (i.e. narrow domains). In particular, it is argued in the literature cited above that phonetic rules become categorical (i.e. phonological), at which point they are phrase level rules, and then they gradually become word level rules and finally stem level rules. A striking example (Bermúdez-Otero 2015) supporting domain narrowing is the progression of postnasal g-Deletion from phrase final position to word-final position and finally to stem-final position at various stages in the history of English (see Table 5.4). The way in which the /ng/ sequence in bold (fifth column) is realized at the various stages is illustrated here.

Table 5.4: Domain narrowing in the history of English g-Deletion (adapted from Bermúdez-Otero 2015: 384)

Stage 0	Stage 1	Stage 2	Stage 3	/ng/	
[ŋg]	[ŋg]	[ŋg]	[ŋg]	elo**ng**ate	-----
[ŋg]	[ŋg]	[ŋg]	[ŋ]	prolo**ng**-er	STEM LEVEL
[ŋg]	[ŋg]	[ŋ]	[ŋ]	prolo**ng** it	WORD LEVEL
[ŋg]	[ŋ]	[ŋ]	[ŋ]	prolo**ng** ⟧	PHRASE LEVEL

Each of the four stages depicted in Table 5.4 is shown in Bermúdez-Otero (2015) to be attested. g-Deletion was absent at Stage 0. At Stage 1 it applied at the end of a phrase (⟧), at Stage 2 at the end of a word, and at Stage 3 at the end of a stem.

I consider and reject casting my treatment of Rhoden from §5.2 in the domain narrowing approach. The same conclusions holds for the other case studies discussed in this chapter (in §5.3).

Recall that my treatment presupposes Final Fortition was present in the grammar before Velar Fronting-5, which was then added at the end of the grammar to produce the transparent Stage 2 Soest system. At Stage 3, those two rules are reordered, thereby producing the opaque Rhoden system. That treatment is given in a simplified form in Table 5.5. I omit the numerical suffix on velar fronting for greater transparency.

Table 5.5: Monostratal approach

Stage 1	Stage 2	Stage 3
Final Fortition	Final Fortition Velar Fronting	Velar Fronting Final Fortition

The monostratal treatment in Table 5.5 does not refer to the distinction between phrase level, word level, and stem level, as in Table 5.4. One way of applying that approach to Table 5.5 would be to modify it by taking the three levels into consideration:

Table 5.6: Domain narrowing

Stage 1	Stage 2i	Stage 2ii	Stage 3	
			Velar Fronting	Stem level
Final Fortition	Final Fortition	Final Fortition Velar Fronting	Final Fortition	Word level
	Velar Fronting			Phrase level

At Stage 1, Final Fortition is present (and is assumed to be at the word level), but velar fronting is absent. The latter process is added at the end of the grammar at Stage 2i at the phrase level and then works its way up to the word level at Stage 2ii. At Stage 3 (Rhoden) the domain of velar fronting narrows even further to the stem level. Stages 2i and 2ii correspond to two stages of Soest (not distinguished above).

In §12.8.2 it is shown that velar fronting is a word level rule in all dialects for which data are available. There is therefore no evidence that there is some variety of German in which velar fronting is (or ever was) a phrase level rule. Given that conclusion I reject Stage 2i in Table 5.6. It is possible in theory to adopt an approach with a word level and a stem level as in Table 5.6, but it is also possible to collapse the two into a single level (word level), as in Table 5.5. Occam's Razor points to Table 5.5 as the simpler of the two treatments, and this is therefore the one I adopt. An additional argument pointing to the monostratal approach in Table 5.5 is that to the best of my knowledge there is no evidence from German dialects for a distinction between stem level affixes and word level affixes, as proposed for English (§2.2.1).

5.5.2 Linguistic and philological evidence for historical stages

From the synchronic perspective velar fronting has been shown in Chapters 3 and 4 to be either fed or bled by another rule. The synchronic relationships ("Rules W/X feed velar fronting" or "Rules Y,Z bleed velar fronting") are assumed to directly reflect history in the sense that Rules W,X,Y,Z preceded velar fronting temporally. The same point holds for the relationship between the epenthesis of schwa and velar fronting discussed in §5.4. In §5.2 and §5.3 I considered dialects where velar fronting is counterfed by another process (Rule W) and postulated that the synchronic ordering was originally the reverse, i.e. "Rule W feeds velar fronting" > "velar fronting is counterfed by Rule W".

One question not discussed above is whether or not the historical relationships between velar fronting and the specific changes referred to as Rule W-Z can actually be confirmed with linguistic and/or philological evidence. Unfortunately that evidence is often (but not always) lacking. I discuss briefly the case studies referred to above.

Linguistic argumentation discussed in later chapters can be adduced that velar fronting must have been phonologized very early, namely in OHG (500–1050) for HGm and OSax (800–1150) for LGm, although it is also possible that phonologization occurred in some places at a later time. This topic is discussed in Chapter 16. The important point is that if Rules W-Z were present in the grammar before velar fronting, then the former changes must have been very early ones.

My claim that the epenthesis of schwa precedes velar fronting diachronically (§5.4) derives strong independent support. Braune (2004: 71–73) discusses orthographic evidence for Schwa Epenthesis ('Sprossvokale') at length, concluding that vowels were often epenthesized between a liquid and *h* in OHG, e.g. OHG *duruh* (< WGmc $^{+}$[θurx]) 'through'. That type of epenthesis was especially prevalent in Franconian varieties of OHG, which was the immediate precursor of MFr varieties like Sörth discussed above.

Two of the case studies discussed earlier involved SwGm varieties. In Maienfeld (§3.3) velar fronting is bled by a rule of Debuccalization, and in Rheintal (§3.4) it is fed by a rule fronting schwa (Schwa Fronting-1). However, there is no evidence available for those two places concerning the chronology of velar fronting or the processes debuccalizing /x/ or fronting schwa. There is no reason to assume that velar fronting must have been active in OHG in either of those two dialects because they each phonologized that process independently from one another and independently from all other German dialects.

A greater challenge is to confirm the relationship between Final Fortition and velar fronting presupposed for LGm in (11) and (12). Orthographic evidence suggests that some version of Final Fortition was probably already present in OSax. Holthausen (1900: 78) observes that the lenis labial fricative in that language (traditionally transcribed as [ƀ]) was realized as fortis [f] in word-final position and before fortis obstruents. Holthausen (1900: 81) also assumes that [ɣ] was realized as fortis [x] in final position, although the orthographic evidence he cites is only sporadic. The philological evidence is admittedly thin; however, it is conceivable that a specific version of Final Fortition with fricatives as targets was present before velar fronting was phonologized for the Wph dialects in question (Soest, Rhoden). See Foerste (1957: 1759) and Woods (1975: 23–27) for some discussion of the status of Final Fortition in OSax.

A difficult ordering relationship to confirm is my claim that the rules creating [x] from /ʀ/ were already active and applied transparently before the opaque stage arose (recall 27 and 31). To the best of my knowledge no linguistic or philological evidence is available which might (dis)confirm that treatment. It was assumed above that the |ʁ| created from /ʀ/ surfaced as [x] in coda position by either Final Fortition or Laryngeal Assimilation-2. According to Paul (2007: 131–133), orthographic evidence from OHG and MHG suggests that there was considerable variation concerning when and where lenis fricatives were realized as fortis. For more extensive discussion on dating Final Fortition the reader is referred to Mihm (2004). In any case, no orthographic evidence from OHG or MHG suggests that *r* in those earlier stages had a [x] realization in coda position.

5.6 Conclusion

The opaque examples discussed in this chapter can all be captured procedurally in terms of the interaction of one rule creating palatal [ç] from velar /x/ (velar fronting) and another one deriving |x| from an independent segment (Rule W). Since the velar derived by Rule W does not feed velar fronting, the former counterfeeds the latter; hence, opaque sequences like [ix] involve underapplication opacity in the synchronic grammar.

In the following chapter I discuss two dialects in which velar fronting creates palatals like [ç] from the corresponding velars (/x/), but there are also regular instances of [x] in the neighborhood of front vowels that also derive from /x/. The dialects in question therefore have sequences like [iç] (from /ix/) and ones like [ix] (from /ix/). The unexpected (opaque) velar referred to here is therefore not the consequence of a counterfeeding order in the synchronic phonology. Instead, I demonstrate that the opaque velar [x] in sequences like [ix] are the consequence of a unique representation for the preceding front vowels.

6 Neutral vowels

6.1 Introduction

In the SwGm dialects discussed below velar fronting is an active synchronic process creating a palatal (e.g. [ç]) from the corresponding velar (e.g. /x/), but there are also many regular instances of underlying velars (e.g. /x/) surfacing unexpectedly without change (e.g. [x]) in the front vowel context. For example, in one dialect, the /i/ component of the diphthong /ei/ triggers the fronting of a following /x/ to [ç], but /x/ underapplies after the /i/ component of the diphthong /øi/, i.e. [eiç] vs. [øix]. The aberrant vocoid – that is, the [i] in [øi] – is a neutral vowel (§2.4.2), defined as a phonetically front vowel lacking the place feature [coronal], as in (1b). By contrast, nonneutral vowels like the /i/ in /ei/ are phonetically front and phonologically [coronal], as in (1a).[1]

(1) Representations for front vowels:

a. Front nonneutral vowels:

$$\begin{bmatrix} -\textsc{cons} \\ \alpha\mathrm{F} \end{bmatrix}$$
$$|$$
$$[\textsc{coronal}]$$

b. Neutral vowels:

$$\begin{bmatrix} -\textsc{cons} \\ \alpha\mathrm{F} \end{bmatrix}$$

The representation in (1b) is intended to indicate the absence of [coronal]. Front rounded neutral vowels (/y/ or /ʏ/) present in both dialects discussed below must bear a feature capturing roundedness to make them distinct from their unrounded counterparts.

The neutral vowel in (1b) derived historically from a back vowel, e.g. /øi/ < /ou/; Recall Figure 2.9. The vocalic change that created (1b) therefore exemplifies Vowel Fronting, which in this case involved the deletion of the backness feature

[1] In (1), [αF] is an abbreviation for all other distinctive properties (e.g. the major class feature [+sonorant], height features [±high] and [±low], the tenseness feature [±tense], or manner features like [±nasal] if there is a contrast between oral and nasalized vowels). The presence of [αF] and in representation (1b) makes neutral vowels distinct from schwa, which bears only [+sonorant] and [−consonantal], but no additional features.

for back vowels without the addition of the [coronal]. In that type of example, the historical process of velar fronting underapplied after historically back sounds like /øi/; hence, velar sounds like [x] in the context of neutral vowels like [øi] are opaque.

In the remainder of this chapter I present two case studies from HstAlmc illustrating neutral vowels (§6.2, §6.3). In §6.4 I consider how neutral vowels emerged historically, and in §6.5 I provide some discussion. The chapter concludes in §6.6.

6.2 Highest Alemannic (part 1)

The present section investigates the patterning of dorsal fricatives and affricates in the HstAlmc variety described in detail by Wipf (1910), spoken in the town of Visperterminen in the Swiss canton of Valais (Wallis; Footnote 3.2). Visperterminen is part of a large velar fronting island comprising Upper Valais because it is surrounded by non-velar fronting regions; see §15.8 for discussion.

The patterning of dorsal fricatives and affricates in Visperterminen can only be understood by considering first the phonetics and especially the phonology of vowels (§6.2.1). The intricate distribution of velar and palatal stops and affricates is discussed in §6.2.2.

6.2.1 Phonetics and phonology of vowels

Visperterminen has phonemic oral and nasalized vowels. The monophthongs consist of front vowels (oral /iː i yː eː e ɛː ɛ æ æː/ and nasalized /ĩ ĩː ỹː ẽː ɛ̃ ɛ̃ː/) and back vowels (oral /(uː) u oː o ɑː ɑ/ and nasalized /ũ õ õː ɑ̃ ɑ̃ː/). /uː/ is parenthesized because it occurs in only a very small number of words (Wipf 1910: 11). The only front rounded monophthongs are /yː/ and /ỹː/.[2] There are six phonemic diphthongs, namely oral /øi ei yo iæ/ and nasalized /ɑ̃i ẽi/. Note that two front rounded vowels occur in diphthongs which are absent in the system of monophthongs, i.e. /ø/ in /øi/ and /y/ in /yo/.

Visperterminen is extremely conservative in the sense that it preserves a number of features from OHG. One such feature is the retention of full vowels in unstressed syllables, which were ultimately reduced to schwa in MHG, e.g. [hilffu]

[2] [yː] derives historically from OHG [uː], which underwent a context-free fronting, e.g. OHG [fuːl] > [fyːl] 'lazy'. Nasalized vowels arose historically through the assimilation of nasality from a nasal consonant to a preceding vowel followed by the deletion of that nasal consonant before a fricative. The details of that change (Wipf 1910: 44–45) exceed the goals of the present analysis.

'help-1SG' (cf. MoStGm [hɛlfə]); Wipf (1910: 146). Since Vowel Reduction (Chapter 4) never occurred in Visperterminen, [ə] is not a phonemic vowel. Wipf transcribes the second element of the diphthong [iæ] as schwa (⟦ə⟧). However, she notes that the pronunciation with [ə] as the second component only holds for fast speech ("das rasche zusammenhängende Sprechen"; Wipf 1910: 12). In the same passage she oberves that the pronunciation of the second part of the diphthong in question with the low front vowel [æ] is typical for slower speech. The example she gives is the word *Fieber* 'fever', which can be pronounced [fiəber] or [fiæber]. In the related dialect discussed below in §6.3 (Brun 1918), the author makes a similar observation, but he consistently transcribes the second component of the diphthong in question as (⟦æ⟧; Brun 1918: 18–19). I transcribe the diphthong [iæ] henceforth with [æ]; more significantly, there is evidence discussed below that [i] and [æ] in [iæ] are phonologically front ([coronal]) vowels. I see the pronunciation [iə] as a consequence of a rule of phonetic implementation that is not relevant for the phonology.

The two components of the six diphthongs can be made distinct by referring to features referring to height, roundedness, backness, and nasality. Consider first /øi/ and /ei/. Those two diphthongs have in common that the first part is mid and front and the second part high (i.e. /i/). The difference between the /ø/ and the /e/ in the first component of /øi/ and /ei/ involves only rounding. For the two oral diphthongs /yo/ and /iæ/ the first component is high (/y/ or /i/) and the second component nonhigh (/o/ or /æ/). Note that the two vowels /o/ and /æ/ differ in terms of backness. The two nasalized diphthongs /ãi/ and /ẽi/ have in common that the first component is nonhigh (/ã/ or /ẽ/) and the second component high (/i/). The difference between /ã/ or /ẽ/ is one of backness. Phonological representations for the diphthongs are provided below.

The four oral diphthongs /øi ei yo iæ/ are phonemic because they contrast with one another and with monophthongs. Although actual minimal pairs were not found in the original source, it is not difficult to find examples of words in which those diphthongs appear in very similar environments. In (2) I present monosyllabic words in which the four oral diphthongs surface between two consonants.[3]

(2)	a.	teiff	[teiff]	tief	'deep'	37
	b.	briəf	[briæf]	Brief	'letter'	38
	c.	böim	[bøim]	Baum	'tree'	38

[3] All of the oral monophthongs can also surface as the vowel in CVC words, although I present no examples here. I conclude that there is no evidence that the diphthongs in (2) derive from monophthongs as is sometimes proposed for other languages (§2.2.3).

d. büob [byob] Bube 'single young man' 40

From the point of view of phonology, the four diphthongs in (2) are not derived. Thus, they are present in the underlying representations as /ei/, /iæ/, /øi/ and /yo/ and surface without change as [ei], [iæ], [øi] and [yo]. However, I show below that there are also regular Umlaut-based alternations involving /ei/~/øi/ and /iæ/~/yo/.

The status of the two nasalized diphthongs /ɑ̃i/ and /ẽi/ in the synchronic phonology (in particular [ɑ̃i]) is not as clear-cut as the status of the four oral diphthongs. Since /ɑ̃i/ and /ẽi/ derived historically from an oral vowel plus nasal consonant sequence before a fricative (recall Map 2), they occur primarily in the context before the fricative, e.g. [xɑ̃iʃt] 'can-2sg' (cf. MoStGm *kannst*), [gʃpẽiʃt] 'ghost' (cf. MoStGm *Gespenst*). Word-finally, /ẽi/ surfaces in words like [klẽi] 'small' (cf. MoStGm *klein*). In that context it contrasts with the oral diphthongs, e.g. [hiə] 'here', [fryo] 'early'. Wipf (1910: 45) notes that native speakers often pronounce [ɑ̃i] as [ɑŋ], which suggests that the former is synchronically derived from the latter. I analyze the [ẽi] and [ɑ̃i] in words like the ones given above as phonemic (i.e. /ẽi/ and /ɑ̃i/), although it will be clear below that an analysis in which [ɑi] is synchronically derived from /ɑŋ/ is compatible with my treatment.[4] It will be seen below that there are Umlaut alternations involving [ẽi]~[ɑ̃i].

The correct features for vocalic segments can be established by considering the way in which they behave phonologically. It is shown on the basis of vocalic alternations that certain front vowels in diphthongs require neutral representations as in (1b) and others the nonneutral representation in (1a).

As indicated in (3), vocalic alternations (Umlaut) fall into one of three categories. First, back monophthongs alternate with the corresponding front unrounded monophthongs (in 3a).[5] Second, front rounded monophthongs are the umlauted counterparts of the corresponding front unrounded monophthongs (as in 3b). Third, diphthongs show the pattern of alternation illustrated in (3c). Note that the first component of the diphthongs in the two alternating pairs [øi]~[ei] and [yo]~[iæ] exhibit the same pattern as in (3b). By contrast, the second part of

[4]The mirror-image change (nasalized vowel is realized as the corresponding oral vowel plus [ŋ]) has a parallel in the realization of French loanwords in MoStGm, e.g. [pɑʀfœ̃ː]>[pɑʀfœŋ] 'perfume'; Mangold (2005: 65).

[5][uː]~[iː] alternations are apparently unattested because [uː] is a rare sound. No examples could be found in the original source in which the nasalized vowels [õ] or [õː] occur in the context for Umlaut. I omit from the present discussion the short low back vowel [ɑ], which surfaces in the Umlaut context in some morphemes as [e] and in others as [æ]. That type variation exemplifies a complication that exceeds the goals of the present work.

[øi] remains unchanged in [ei], while the second component of [yo] corresponds to [æ] in the Umlaut context.

(3) a. [u]~[i]
[ũ]~[ĩ]
[o]~[e]
[oː]~[eː]
[ɑː]~[æː]
b. [yː]~[iː]
[ỹː]~[ĩː]
c. [øi]~[ei]
[yo]~[iæ]
[ɑ̃i]~[ẽi]

The three patterns in (3) are displayed in (4–6). The morphological contexts for Umlaut in these examples are the plural of nouns and diminutives.

(4)	a.	hund	[hund]	Hund	‘dog’	122
		hind	[hind]	Hunde	‘dogs’	136
	b.	su͔	[sũ]	Sohn	‘son’	122
		si͔	[sĩ]	Söhne	‘sons’	122
	c.	xopf	[xopf]	Kopf	‘head’	93
		xepf	[xepf]	Köpfe	‘heads’	93
	d.	flō	[floː]	Floh	‘flea’	122
		flē	[fleː]	Flöhe	‘fleas’	35
	e.	fɑlt	[fɑːlt]	Falte	‘wrinkle’	122
		fǣlt	[fæːlt]	Falten	‘wrinkles’	122
(5)	a.	krǖt	[kryːt]	Kraut	‘herb’	93
		krītter	[kriːter]	Kräuter	‘herbs’	93
	b.	tsü͔	[tsỹː]	Zaun	‘fence’	122
		tsī͔	[tsĩː]	Zäune	‘fences’	122
(6)	a.	bøim	[bøim]	Baum	‘tree’	38
		beim	[beim]	Bäume	‘trees’	39
	b.	brüoder	[bryoder]	Bruder	‘brother’	40
		briədri	[briædri]	Bruder, dim	‘brother-DIM’	40
	c.	He͔iši	[hẽiʃi]	Hans, dim	‘Hans-DIM’	168
		Hɑ͔isi	[hɑ̃isi]	Hans, dim	‘Hans-DIM’	168

If a front unrounded vowel occurs in the Umlaut context, then that vowel does not exhibit an alternation, e.g. [rind] 'cow' vs. [rinner] 'cows'.

I propose that monophthongs have the representations in (7). In those structures, front unrounded segments are nonneutral and hence [coronal]; see (7a). In contrast to all of the dialects considered in previous chapters, the back monophthongs of Visperterminen are [peripheral]; see (7c). That structure follows Rice (2002), who proposes that [peripheral] expresses backness and/or roundedness in vowels. Neither [dorsal] nor [labial] are necessary in the representation of back monophthongs given the structure in (7c). The representation for front rounded sounds is presented in (7b). In contrast to (7a) and (7c), the one in (7b) is a complex structure with [coronal] and [peripheral]. The advantages of analyzing the monophthongs in (7b,c) as [peripheral] and not as [dorsal] and/or [labial] are discussed below.

(7) a. Front unrounded:

$\begin{bmatrix} -\text{CONS} \\ \alpha\text{F} \end{bmatrix}$

|

[CORONAL]

b. Front rounded:

$\begin{bmatrix} -\text{CONS} \\ \alpha\text{F} \end{bmatrix}$

/ \

[CORONAL] [PERIPHERAL]

c. Back:

$\begin{bmatrix} -\text{CONS} \\ \alpha\text{F} \end{bmatrix}$

|

[PERIPHERAL]

The contrast between the simplex representations in (7a) and (7c) vs. the complex structure in (7b) derives support from markedness. Regardless of how one defines that term, it is uncontroversially the case that front rounded vowels like [yː] are more marked than both their back ([uː]) and front ([iː]) counterparts (e.g. De Lacy 2006, Rice 2007).

Individual monophthongs are assigned distinctive features, as indicated in (6.1) for the oral vowels. Note that [peripheral] is assigned twice, depending on whether or not it corresponds to the backness or the roundedness dimension. The distinction between short and long vowels is ignored here.

Table 6.1: Distinctive features for vowels (Visperterminen)

	iː i	yː	eː e	ɛː ɛ	æː æ	uː u	oː o	ɑ ɑː
[coronal]	✓	✓	✓	✓	✓			
[peripheral]						✓	✓	✓
[high]	+	+	−	−	−	+	−	−
[low]			−	−	+		−	+
[tense]				−				
[peripheral]		✓						

I classify the six diphthongs in terms of the values of the feature [±nasal] and for a height feature ([±high] or [±low]) for each component, as in (8). Note that four of these diphthongs consist of [−high] followed by [+high] (in 8a-d) and two are [+high] followed by [+low] (in 8e-f). I consider additional features for diphthongs below.

(8) a. /øi/: $\begin{bmatrix}-\text{NASAL}\\-\text{HIGH}\end{bmatrix}$ $\begin{bmatrix}-\text{NASAL}\\+\text{HIGH}\end{bmatrix}$

b. /ei/: $\begin{bmatrix}-\text{NASAL}\\-\text{HIGH}\end{bmatrix}$ $\begin{bmatrix}-\text{NASAL}\\+\text{HIGH}\end{bmatrix}$

c. /ɑ̃i/: $\begin{bmatrix}+\text{NASAL}\\-\text{HIGH}\end{bmatrix}$ $\begin{bmatrix}+\text{NASAL}\\+\text{HIGH}\end{bmatrix}$

d. /ẽi/: $\begin{bmatrix}+\text{NASAL}\\-\text{HIGH}\end{bmatrix}$ $\begin{bmatrix}+\text{NASAL}\\+\text{HIGH}\end{bmatrix}$

e. /yo/: $\begin{bmatrix}-\text{NASAL}\\+\text{HIGH}\end{bmatrix}$ $\begin{bmatrix}-\text{NASAL}\\+\text{LOW}\end{bmatrix}$

f. /iæ/: $\begin{bmatrix}-\text{NASAL}\\+\text{HIGH}\end{bmatrix}$ $\begin{bmatrix}-\text{NASAL}\\+\text{LOW}\end{bmatrix}$

The feature [+low] can be justified in (8f) because /æ/ is phonetically low, but the same cannot be said about (8e) because /o/ is phonetically mid and not low. It needs to be stressed that the features adopted here are intended to capture phonological patterns and not the phonetics of the sounds in question. Recall the discussion of vowels in §2.2.3 and the analysis of Rheintal /ɛː ɛ œː œ/ as phonologically [+low] in §3.4. The /o/ component of the /yo/ diphthong in (8e) and the /æ/ component of /iæ/ in (8f) do not bear the same features as the respective monophthongs /o/ and /æ/ in Table (6.1), although my analysis does not crucially depend on this.

The complete featural representations for the four [−high]-[+high] diphthongs are presented in (9). In the following discussion I concentrate on the place features.

(9) a. /øi/:

$$\begin{bmatrix}-\textsc{cons}\\-\textsc{nas}\\-\textsc{high}\end{bmatrix} \quad \begin{bmatrix}-\textsc{cons}\\-\textsc{nas}\\+\textsc{high}\end{bmatrix}$$

$$\big[\textsc{peripheral}\big]$$

b. /ei/:

$$\begin{bmatrix}-\textsc{cons}\\-\textsc{nas}\\-\textsc{high}\end{bmatrix} \quad \begin{bmatrix}-\textsc{cons}\\-\textsc{nas}\\+\textsc{high}\end{bmatrix}$$

$$\big[\textsc{coronal}\big]$$

c. /ɑ̃i/:

$$\begin{bmatrix}-\textsc{cons}\\+\textsc{nas}\\-\textsc{high}\end{bmatrix} \quad \begin{bmatrix}-\textsc{cons}\\+\textsc{nas}\\+\textsc{high}\end{bmatrix}$$

$$\big[\textsc{peripheral}\big]$$

d. /ẽi/:

$$\begin{bmatrix}-\textsc{cons}\\+\textsc{nas}\\-\textsc{high}\end{bmatrix} \quad \begin{bmatrix}-\textsc{cons}\\+\textsc{nas}\\+\textsc{high}\end{bmatrix}$$

$$\big[\textsc{coronal}\big]$$

The diphthongs in (9b) and (9d) consist of a sequence of two front vowels which share the feature [coronal] by the OCP (recall §2.2.3). Both parts of /ei/ and /ẽi/ are therefore nonneutral, as in (1a).

The diphthongs in (9b,d) can now be compared with the ones in (9a,c): The second part of /øi/ and /ɑ̃i/ is specified for a height feature but not for [coronal] or [peripheral]; hence, the /i/ in /øi/ and /ɑ̃i/ – but not the /i/ in /ei/ or /ẽi/ – is a neutral vowel, as in (1b). The first part of /øi/ bears the place feature [peripheral]; [coronal] is redundant for /ø/ in /øi/ because there are no diphthongs in Visperterminen consisting of the corresponding back vowel plus /i/, i.e. /oi/. Some evidence that the feature [coronal] is absent in the representation for /ø/ comes from phonetics. Wipf (1910: 11–12) notes that her informants pronounced that vowel as [ø], but that other informants appeared to be pronouncing [o]. The fact that the front rounded vowel in /øi/ vacillates between a front vowel and a back vowel supports a structure like the one in (9a) in which the frontness feature ([coronal]) is absent.[6]

The vowel /ɑ̃/ in /ɑ̃i/ in (9c) is phonetically back and phonologically [peripheral]. Note that there is no contrast between /ɑ̃i/ and a nasalized diphthong

[6]Wipf also notes that the second part of /øi/ can be rounded, i.e. /øi/ can be realized as [øy]. This type of variation is also consistent with the representation in (9a) because a feature for rounding is absent.

whose first member is low and front (/æ̃i/); hence, the feature [peripheral] can be interpreted in the phonetics as a back vowel and not as a front vowel.[7]

In (10) I give the representations for the two [+high]-[+low] diphthongs in (8e,f):

(10) a. /yo/:

$$\begin{bmatrix} -\textsc{cons} \\ -\textsc{nas} \\ +\textsc{high} \end{bmatrix} \quad \begin{bmatrix} -\textsc{cons} \\ -\textsc{nas} \\ +\textsc{low} \end{bmatrix}$$

$$[\textsc{peripheral}]$$

b. /iæ/:

$$\begin{bmatrix} -\textsc{cons} \\ -\textsc{nas} \\ +\textsc{high} \end{bmatrix} \quad \begin{bmatrix} -\textsc{cons} \\ -\textsc{nas} \\ +\textsc{low} \end{bmatrix}$$

$$[\textsc{coronal}]$$

Both parts of the diphthong /iæ/ in (10b) are front and therefore marked [coronal] in the phonological representation. The representation in (10b) is therefore akin to the structures in (10b,d) for the other two front diphthongs.

The diphthong /yo/ in (10a) consists of a single [peripheral] component. As was the case with /øi/, it is not necessary to include the feature [coronal] for the /y/ component of /yo/ because there is no diphthong in Visperterminen consisting of the corresponding back vowel plus /o/, i.e. /uo/. The front rounded vowel in (10a) does not bear the feature [coronal] and is therefore neutral vowel, as in (1b).

The representations for monophthongs and diphthongs presented above hold regardless of whether or not the sound in question participates in Umlaut alternations. For example, the diphthongs /ei/ and /iæ/ from (2) do not alternate with other vowels. However, the /ei/ and /iæ/ alternate with /øi/ and /yo/ in (6a,b).

Given the structures for vowels posited above, Umlaut alternations in Visperterminen are expressed as in (11). The abbreviation 'mcat' is the set of morphological categories (e.g. singular~plural in nouns).

[7] It was noted above that [ãi] may be derived synchronically from /ɑŋ/. That type of analysis would require that [+nasal] spreads from /ŋ/ onto the preceding vowel and that /ŋ/ changes into a nasalized vowel (i.e. /ĩ/). If that were the correct analysis then the change from [ŋ] to the nasalized vowel would require [+consonantal] to change to [−consonantal] and [peripheral] to be deleted.

(11) Umlaut in diphthongs (in 11a) and monophthongs (in 11b):

a. (/ … [−CONS] … [−CONS] … /)$_{mcat}$ ~
[PERIPHERAL]

(/ … [−CONS] … [−CONS] … /)$_{mcat}$
[CORONAL]

b. (/ … [−CONS] …/)$_{mcat}$ ~ (/… [−CONS] …/)$_{mcat}$
[PERIPHERAL] [CORONAL]

The advantage of analyzing back monophthongs as [peripheral] and not as [dorsal] (and/or [labial]) is that the umlauted vowels also include front rounded monophthongs. Recall from (3b) that /yː/ and /ỹː/ alternate with /iː/ and /ĩː/. In an alternative featural system in which front rounded monophthongs are [coronal] and [labial], it is not clear how (3a) and (3b) can be unified.

In (12) I illustrate the alternations involving the diphthongs in (3c):

(12) a. /øi/ ~ /ei/

$$\begin{bmatrix}-\textsc{cons}\\-\textsc{nas}\\-\textsc{high}\end{bmatrix}\begin{bmatrix}-\textsc{cons}\\-\textsc{nas}\\+\textsc{high}\end{bmatrix} \qquad \begin{bmatrix}-\textsc{cons}\\-\textsc{nas}\\-\textsc{high}\end{bmatrix}\begin{bmatrix}-\textsc{cons}\\-\textsc{nas}\\+\textsc{high}\end{bmatrix}$$

$$[\textsc{peripheral}] \qquad [\textsc{coronal}]$$

b. /ãi/ ~ /ẽi/

$$\begin{bmatrix}-\textsc{cons}\\+\textsc{nas}\\-\textsc{high}\end{bmatrix}\begin{bmatrix}-\textsc{cons}\\+\textsc{nas}\\+\textsc{high}\end{bmatrix} \qquad \begin{bmatrix}-\textsc{cons}\\+\textsc{nas}\\-\textsc{high}\end{bmatrix}\begin{bmatrix}-\textsc{cons}\\+\textsc{nas}\\+\textsc{high}\end{bmatrix}$$

$$[\textsc{peripheral}] \qquad [\textsc{coronal}]$$

c. /yo/ ~ /iæ/

$$\begin{bmatrix}-\textsc{cons}\\-\textsc{nas}\\+\textsc{high}\end{bmatrix}\begin{bmatrix}-\textsc{cons}\\-\textsc{nas}\\+\textsc{low}\end{bmatrix} \qquad \begin{bmatrix}-\textsc{cons}\\-\textsc{nas}\\+\textsc{high}\end{bmatrix}\begin{bmatrix}-\textsc{cons}\\-\textsc{nas}\\+\textsc{low}\end{bmatrix}$$

$$[\textsc{peripheral}] \qquad [\textsc{coronal}]$$

The representations for vowels were posited on the basis of Umlaut alternations. The structures defended above include nonneutral vowels as well as neutral vowels. The following predictions can be made regarding the vowels of Visperterminen:

(13) a. /i/ in /øi/ and /ãi/ does not behave phonologically like a coronal;
b. /y/ in /yo/ does not behave phonologically like a coronal;
c. /iæ/ behaves phonologically like a coronal;
d. /ø/ in /øi/ does not behave phonologically like a coronal;
e. /o/ in /yo/ does not behave phonologically like a dorsal

In §6.2.2 I demonstrate that the predictions in (13a-c) are correct on the basis of the patterning of dorsal fricative and dorsal affricate allophones. By contrast, predictions (13d,e) are shown to be untestable.

6.2.2 Dorsal fricatives and affricates

Visperterminen possesses two singleton dorsal fricatives, namely velar [x] (=⟦x⟧) and palatal [ç] (=⟦χ⟧); Wipf (1910: 14). [x] and [ç] also have geminate counterparts, namely [xx] (=⟦xx⟧) and [çç] (=⟦χχ⟧). It is clear from the original source (Wipf 1910: 16) that the geminate articulation is the surface realization of a dorsal fricative after a short vowel. ("Der Spirant *x* resp. *χ* kommt nur nach kurzem Vokal als Geminata vor".) By contrast, the singleton counterparts [x] and [ç] occur in the elsewhere case, i.e. after a long vowel or consonant or word-initially. I assume that singletons and geminates are allophones, although I do not provide a formal treatment.

As in Rheintal (§3.4), Visperterminen also possesses the two dorsal affricates, namely velar [kx] (=⟦kx⟧) and palatal [kç] (=⟦kχ⟧). Affricates are phonemic because they contrast with stops and fricatives at the same place of articulation, e.g. after [u] in [luk] 'loose' vs. [bruxx] 'fracture' vs. [ʃtukx] 'piece'. The distribution of [kx] and [kç] is shown below to mirror the distribution of the corresponding fricatives. The relationship between velar and palatal fricatives and affricates (ignoring the geminate realizations) is depicted in (14) for word-initial and post-sonorant position..

(14) /x/ /kx/

[x] [ç] [kx] [kç]

The intricate facts involving the distribution of the sounds in (14) are summarized in (15) and (16). These statements mirror very closely the historical observations in the original source (Wipf 1910: 92, 93, 96).

(15) [x]/[kx] and [ç]/[kç] in word-initial onsets:
   a. [ç] occurs word-initially only before high front vowels but not before [yo];
   b. [x] occurs word-initially before nonhigh front vowels, back vowels or a coronal sonorant consonant;
   c. [x] occurs word-initially before [yo];
   d. [kç] and [kx] have the same distribution as word-initial [x]/[ç].

(16) [x]/[kx] and [ç]/[kç] after a sonorant:
   a. [ç] occurs after a high front vowel with the exception of [øi] and [ãi];
   b. [ç] occurs after [iæ];
   c. [x] occurs after a nonhigh front vowel or a back vowel (not including [iæ]);
   d. [x] occurs after [øi] and [ãi];

e. [ç] occurs after a high front vowel followed by a liquid;
f. [x] occurs after any other vowel followed by a liquid;
g. [kç] and [kx] have the same distribution as [x]/[ç].

The generalizations in (15) and (16) together indicate that palatal and velar fricatives and palatal and velar affricates do not contrast.

Distributional statement (15a) is revealed in (17): Word-initial [ç] occurs before a high front vowel, namely [iː] (in 17a), [i] (in 17b), [iæ] (in 17c) or [ỹː] (in 17d). The historical source for velar and palatal fricatives and affricates in (17) and in all subsequent datasets is WGmc $^{+}$[k] or $^{+}$[x], although a few assimilated loanwords are included as well. In a number of examples presented below there are front stem vowels that were originally back; thus, Vowel Fronting fed velar fronting. I comment on those examples below.

(17) Word-initial [ç] (from /x/):

a.	χībe	[çiːbe]	zürnen	'be angry.INF'	35
b.	χind	[çind]	Kind	'child'	124
c.	χiəl	[çiæl]	kühl	'cool'	92
d.	χü̜̃χ la	[çỹːçlɑ]	Kunkel	'explosive pellet'	94

The absence of words beginning with a dorsal fricative followed by the oral vowel [yː] is accidental. Evidence that [yː] behaves as a front vowel – like its nasal counterpart [ỹː] – comes from the occurrence of the word-initial palatal affricate before that vowel (see below). It is also shown that /x/ is realized as palatal in the context after [yː].

The data presented below reveal that [x] surfaces in word-initial position in the elsewhere case (=15b,c). In (18), word-initial [x] is followed by a back vowel (in 18a), a non-high front vowel (in 18b), or [yo] (in 18c). Note that sequences like [xyo] reveal underapplication opacity. No examples were found in the original source in which a word-initial dorsal fricative is followed by the back vowel [ɑː] or before the nonhigh front vowel [æː]. I hold these gaps to be accidental.

(18) Word-initial [x] (from /x/):

a.	xuxxi	[xuxxi]	Küche	'kitchen'	93
	xopf	[xopf]	Kopf	'head'	93
	xōru	[xoːru]	Korn	'grain'	93
	xɑtsɑ	[xɑtsɑ]	Katze	'cat'	92

b.	xebjɑ	[xebjɑ]	Käfig	'cage'	93
	xertsɑ	[xertsɑ]	Kerze	'candle'	93
	xɛnnu	[xɛnnu]	können	'be able-INF'	93
	xællɑ	[xællɑ]	Kelle	'trowel'	93
	xeišto	[xeiʃto]	Keim	'germ'	93
	xøiffu	[xøiffu]	kaufen	'buy-INF'	71
c.	xüo	[xyo]	Kuh	'cow'	127
	xüoffɑ	[xyoffɑ]	Kufe	'vat'	40

The examples in (19) show that velar [x] – but not palatal [ç] – occurs in word-initial position before a coronal sonorant consonant, namely [n] (in 19a), [l] (in 19b) or [r] (in 19c); recall (15b). There are no restrictions governing the type of vowel that can follow the sonorant consonant in question. In particular, that vowel can be high and front, but that high front vowel exerts no influence on the initial dorsal fricative, which consistently surfaces as [x].

(19) Word-initial [x] (from /x/):

a.	xnɑll	[xnɑll]	Knall	'bang'	93
	xnæxt	[xnæxt]	Knecht	'vassal'	121
b.	xlɑgu	[xlɑgu]	klagen	'complain.INF'	93
	xliwwe	[xliwwe]	Kleie	'bran-PL'	93
c.	xrīts	[xriːts]	Kreuz	'cross'	93
	xrɑnts	[xrɑnts]	Kranz	'wreath'	93

Wipf includes in her grammar [x]~[ç] alternations like the ones in (20), which suggest that the complementary distribution between word-initial [x] and [ç] described above is a rule-governed process. In the first example in (20a) the stem vowel is [u], which alternates with [i], as in the second example. The pair of words in (20b) is similar to the word pair in (20a), although the stem vowel in [çiːrli] shows the effects of an apparently idiosyncratic process of raising (together with Umlaut). Significantly, the [x] in [xoːru] 'grain' is replaced by [ç] in [çiːrli] 'grain-DIM' because the vowel [iː] follows [x]. The examples in (20c) demonstrate that the stem vowel [o] alternates with [e] but that [x] does not change to [ç] after the latter vowel because [e] is not a high front vowel. The most significant examples are the ones in (20d) because they indicate that opaque [x] is only present before the one diphthong [yo]. When that diphthong is replaced with [iæ] in the plural, opaque [x] surfaces as [ç] as expected.

(20) Dorsal fricatives (from /x/) before alternating vowels:

a.	xurts	[xurts]	kurz	'short'	93
	χirtzer	[çirtser]	kürzer	'shorter'	93
b.	xōru	[xo:ru]	Korn	'grain'	93
	χīrli	[çi:rli]	Korn, dim.	'grain-DIM'	93
c.	xopf	[xopf]	Kopf	'grain'	122
	xepf	[xepf]	Köpfe	'heads'	122
d.	xüo	[xyo]	Kuh	'cow'	127
	χiə	[çiæ]	Kühe	'cows'	127

The data presented up to this point show that [x] and [ç] stand in complementary distribution in word-initial position, although the [yo] context is characterized by opacity.

The examples in (21) demonstrate that the distribution of the velar affricate [kx] and its palatal counterpart [kç] parallels the distribution of the corresponding fricatives (=15d). Thus, [kç] occurs in word-initial position before a high front vowel (in 21a) and [kx] in the elsewhere case (in 21b). The second example in (21a) is important because it illustrates the occurrence of the palatal affricate before [y:]; recall the discussion above on the absence of word-initial dorsal fricatives before [y:].[8]

(21) Word-initial dorsal affricates (from /kx/):

a.	kχitsjot	[kçitsjot]	gekitzelt	'tickled-PART'	69
	kχǖr	[kçy:r]	Kur	'health resort'	95
b.	kxɑffḗ	[kxɑffe:]	Kaffee	'coffee'	95
	kxumpíəru	[kxumpiæru]	kopieren	'copy.INF'	95
	kxērt	[kxe:rt]	gekehrt	'swept-PART'	69

No examples in the original source were found in which a word-initial dorsal affricate surfaces before any of the diphthongs. I interpret this gap as accidental.

The examples in (22) show that [k] does not have a palatal realization. In word-initial position, [k] surfaces before any vowel. Example (22a) has [k] before a high front vowel and the ones in (22b) have [k] before other vowels.

(22) Word-initial [k] (from /k/):

a.	kinte	[kinte]	Launen	'moods'	96

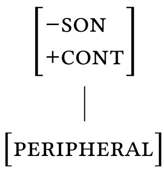
[8]The affricates in [kçitsjot] and [kxe:rt] are synchronically derived from the past participle prefix /k/, which coalesces with the stem-initial fricative (/x/), i.e. /k-xitsjot/ and /k-xe:rt/. The remaining examples in (21) show that there is also a phonemic affricate /kx/.

b.	keittu	[keittu]	schwanken	‘fluctuate.INF’	96
	kætter	[kætter]	Gitter	‘grate’	97
	koffrɑ	[koffrɑ]	Koffer	‘suitcase’	95
	kunto	[kunto]	Konto	‘account’	95

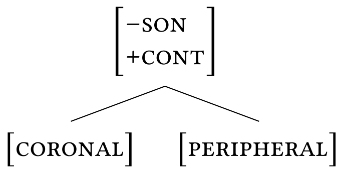
The conclusion is that the velars [x]/[kx] and the corresponding palatals [ç]/[kç] do not contrast in word-initial position. The distribution of those sounds follows if the underlying velars (/x/ and /kx/) and the surface palatals ([ç] and [kç]) have the representations in (23). Given those structures, the rule fronting word-initial /x/ and /kx/ is given in (24). Recall from §2.2.2 that stops are [−sonorant, −continuant], affricates are [−sonorant, −continuant, +continuant], and fricatives are [−sonorant, +continuant]. The target of Wd-Initial Velar Fronting-4 is expressed as the natural class of [−sonorant, +continuant, peripheral] sounds, i.e. /x/ and /kx/ in (23a). The stop /k/ is not a target since that sound is [−continuant]. No spreading occurs from /r l n/ because none of those sounds is [+high].

(23) Representations for dorsal fricatives/affricates:

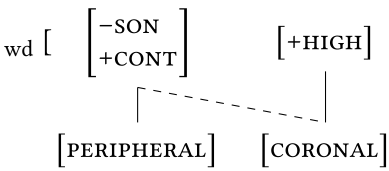
a. /x/, /kx/:



b. [ç], [kç]:



(24) Wd-Initial Velar Fronting-4:



The structures in (23) differ only minimally from the ones presupposed for velar and palatal fricatives in earlier chapters: Velars in Visperterminen are [peripheral] (and not [dorsal]), while palatals are [coronal] and [peripheral] (and not [coronal] and [dorsal]). Wd-Initial Velar Fronting-4 in (24) differs from the corresponding rule posited in the dialects discussed in earlier case studies because the trigger for (24) is restricted to [+high] sounds.

Wd-Initial Velar Fronting-4 spreads [coronal] from a high front segment (e.g. /i/). Recall from (7a,b) that all front nonneutral vowels are [coronal]. The natural class of high [coronal] vowels also includes the /i/ in the diphthong /iæ/, as in

(10b). By contrast, word-initial /x/ surfaces as opaque [x] before /yo/ because the /y/ in that diphthong – as a neutral vowel – lacks [coronal], as in (10a); recall (15c).

Distributional generalization (16a) is exhibited in (25a-g): Palatal fricatives ([ç] or [çç]) surface only after a high front vowel. The categories within (25) illustrate the individual high front vowels, i.e. the oral vowels [i iː yː ei] and the nasalized vowels [ỹː ĩː ẽi]. Note that the palatal fricatives can surface either in word-final position after a vowel or between vowels. Generalization (16b) is exemplified with example (25h).

(25) Postvocalic palatal fricatives (from /x/):

a.	līχt	[liːçt]	leicht	'easy'	35
b.	štiχ	[ʃtiçç]	Stich	'sting'	93
c.	bǖχ	[byːç]	Bauch	'stomach'	35
d.	weiχ	[weiç]	weich	'soft'	94
e.	χü͔χlɑ	[çỹːçlɑ]	Kunkel	'explosive pellet'	94
f.	wī͔χill	[wĩːçill]	Winkel	'angle'	94
g.	de͔iχu	[dẽiçu]	denken	'think.INF'	94
h.	liəχt	[liæçt]	Licht	'light'	38

The examples in (26a-h) illustrate the occurrence of velar fricatives ([x] or [xx]) after back vowels or nonhigh front vowels (=16c). Those eight categories represent the individual vowels, i.e. [u o ɑ ɑː yo e ɛː æ]. The nonoccurrence of words with a velar fricative after the other vowels (e.g. [ɛ eː æː oː] and the nasalized monophthongs) is accidental. The items listed in (26i,j) exemplify (16d): The opaque velar fricative underapplies after the two diphthongs [øi ɑ̃i].

(26) Postvocalic velar fricatives (from /x/):

a.	bruxx	[bruxx]	Bruch	'fracture'	93
b.	loxx	[loxx]	Loch	'hole'	93
c.	bɑxx	[bɑxx]	Bach	'stream'	94
d.	nɑx	[nɑːx]	nahe	'near'	34
e.	süoxu	[syoxu]	suchen	'search.INF'	156
f.	dexxi	[dexxi]	Decke	'blanket'	93
g.	nɛxšt	[nɛːxʃt]	nächst	'next'	34
h.	blæx	[blæx]	Blech	'tin'	94

i.	øix	[øix]	auch	‘also’	95
	røix	[røix]	Rauch	‘smoke’	94
j.	ɑ͔ixo	[ɑ̃ixo]	Butter	‘butter’	94
	dɑ͔ixu	[dɑ̃ixu]	danken	‘thank.INF’	94

[x]~[ç] alternations in postsonorant position are presented in (27a-e). The two stems in (27a) are lexically listed because the vowels are not related by a regular synchronic process, i.e. /ræxt/, /rixt-ig/. Umlaut alternations between [yo] and [iə] in (27b-e) reflect pattern (3c). The pair in (27f) exhibits [o]~[e] Umlaut alternations (=3a), but velar [xx] stays velar [xx] after [e] because that vowel is not [+high].

(27) Dorsal fricatives (from /x/) after front vowels:

a.	ræxt	[ræxt]	recht	‘right’	29
	riχtig	[riçtig]	richtig	‘correct’	29
b.	büox	[byox]	Buch	‘book’	40
	biəχer	[biæçer]	Bücher	‘books’	40
c.	tüox	[tyox]	Tuch	‘towel’	171
	tiəχji	[tiæçji]	Tüchlein	‘towel-DIM’	171
d.	brüox	[bryox]	Pferdegeschirr	‘horse harness’	94
	briəχ	[briæç]	Pferdgeschirr, pl.	‘horse harnesses’	94
e.	bɑ͔ix	[bɑ̃ix]	Bank	‘bench’	94
	be͔iχ	[blẽiç]	Bänke	‘benches’	94
	xlɑ͔ix	[xlɑ̃ix]	(Glocken-)klang	‘sound of bell’	94
	xle͔iχ	[xlẽiç]	(Glocken-)klang, pl.	‘sounds of bell’	94
f.	loxx	[loxx]	Loch	‘hole’	124
	lexxer	[lexxer]	Löcher	‘holes’	33

The most significant examples above involve the occurrence of the opaque velar fricative after the [i] component of [ɑ̃i] and the transparent palatal after the [i] component of [ẽi] in (27e); recall (9c,d)

The examples in (28) demonstrate that palatal [kç] surfaces after a high front vowel, while the data in (29) show that the velar [kx] occurs after all other sounds (=16g). The separate categories in (28–29) indicate the individual vowels. No examples were found in the original source with dorsal affricates after neutral vowels.

(28) Postvocalic palatal [kç] (from /kx/):

a.	dikχ	[dikç]	dick	'fat'	96
b.	bleikχu	[bleikçu]	bleichen	'bleach.INF'	96

(29) Postvocalic velar [kx] (from /kx/):

a.	štukx	[ʃtukx]	Stück	'piece'	96
b.	bokx	[bokx]	Bock	'buck'	96
c.	sɑkx	[sɑkx]	Sack	'sack'	96
d.	dekxu	[dekxu]	decken	'cover.INF'	96
e.	rɛkx	[rɛːkx]	bitter	'bitter'	96
f.	bækxu	[bækxu]	picken	'peck.INF'	96

Visperterminen also has words containing [k] after a high front vowel, which show that [k] has no palatal realization, e.g. [rik] 'back' (Wipf 1910: 98).

The examples in (25–29) reveal that velars and the corresponding palatals do not contrast after a vowel. The palatals are derived from velars by (30):

(30) Velar Fronting-6:

[+HIGH]   [−SON]
|
[CORONAL]   [PERIPHERAL]

Velar Fronting-6 does not apply after /øi/ and /ãi/ (=26i,j) because the /i/ component of both diphthongs is a neutral sound and therefore lacks [coronal]; recall (9a,c). By contrast, spreading occurs after /ei/ (=25d) and /ẽi/ (=26g) because the /i/ in those diphthongs are [coronal]; recall (9b,d).

Example (25h) illustrates that Velar Fronting-6 creates palatals after /iæ/. This is possible because that diphthong is [coronal]; recall (10b). The spreading of [coronal] in /iæ/ occurs as expected: /liæxt/⟶[liæçt].

The data in this section support predictions (13a-c). (13a) is correct because velars and not palatals occur after /ãi/ and /øi/, and (13c) is substantiated because palatals and not velars surface after /iæ/. The data from word-initial position support (13b) because velars and not palatals occur in that position before [yo]. Since Velar Fronting-6 and Wd-Initial Velar Fronting-4 are both triggered by high front vowels, neither (13d) nor (13e) can be (dis)confirmed.

I conclude this section by considering the distribution of the dorsal fricatives and affricates after a consonant. Unlike all of the dialects discussed in the preceding chapters, velars ([x]/[kx]) and palatals ([ç]/[kç]) both occur after a (liquid) consonant; there are no dorsal fricatives or affricates before [n] because nasals deleted in that context by a historical process (Wipf 1910: 44–45). The relevant generalization is that the place of articulation of the dorsal sound is determined by the vowel immediately preceding the liquid (=16e,f). In (31) I show that [ç] occurs after a liquid if the immediately preceding vowel is high and front. The palatal fricative can be either word-final or word-internal before a vowel. In (31a) the liquid in question is [l] and in (31b) it is [r]. In all of the examples presented in (31) the high front vowel preceding the liquid is [i]. The absence of examples with [yː] in that context can be attributed to the lack of OHG words with the cognate vowel [uː] followed by a liquid plus dorsal fricative (Map 2). I speculate that there are similar historical reasons accounting for the lack of words with [iː] or any of the high front nasalized vowels followed by a sequence of liquid plus dorsal fricative.

(31) Postconsonantal [ç] (from /x/):

a.	χilχɑ	[çilçɑ]	Kirche	'church'	94
	milχ	[milç]	Milch	'milk'	94
b.	firχtu	[firçtu]	fürchten	'fear.INF'	42
	birχɑ	[birçɑ]	Birke	'birch'	42

The examples in (32) indicate that velar [x] surfaces after a liquid if the preceding vowel is either back or nonhigh and front. The liquid is [l] in (32a) and [r] in (32b).

(32) Postconsonantal [x] (from /x/):

a.	wulxɑ	[wulxɑ]	Wolke	'cloud'	94
	xɑlx	[xɑlx]	Kalk	'lime'	94
	mælxu	[mælxu]	melken	'milk.INF'	94
b.	sɑrx	[sɑːrx]	Sarg	'coffin'	94
	lerx	[lerx]	Lärche	'larch'	94
	wǣrx	[wæːrx]	Werk	'work'	94

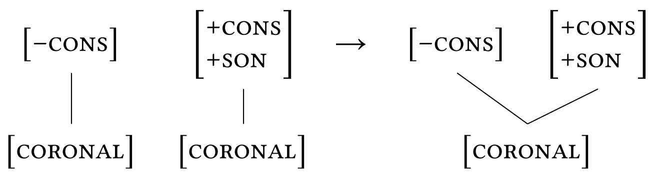
Dorsal affricates have an identical distribution to the corresponding fricatives. Two representative examples given in (33).

(33) Postconsonantal dorsal affricates (from /kx/):

a.	wirkχu	[wirkçu]	wirken	'seem-INF'	96
b.	merkxu	[merkxu]	merken	'notice.INF'	96

I argue that front vowel plus liquid sequences undergo the OCP-motivated change in (34), which merges the two [coronal] features into one. I assume that the first vowel in (34) is not restricted to [+high] sounds; there are no examples suggesting that the change does or does not occur after a nonhigh vowel. Since there are no nasal consonants that can potentially undergo Coalescence-1, I omit [−nasal] from the second segment in (34). Coalescence-1 has a function similar to the two schwa fronting changes posited in §3.4 (for Rheintal) and in §5.4 (for a number of HGm varieties). See also §12.8.1 for further discussion.

(34) Coalescence-1:



In examples like [milç] 'milk' in (31a), Coalescence-1 feeds Velar Fronting-6: /milx/⟶[milç]. By contrast, Coalescence-1 does not affect the /ul/ sequence in examples like [wulxɑ] 'cloud' in (32a); hence, Velar Fronting-6 does not apply: /wulxɑ/⟶[wulxɑ].

6.3 Highest Alemannic (part 2)

Brun (1918) describes a HstAlmc dialect spoken in the community (Gemeinde) of Obersaxen (now known as Obersaxen Mundaun) in the Swiss canton of Grisons (Graubünden); see Footnote 3.2.

Obersaxen is an area in Switzerland settled by people originally from the canton of Valais during the Walser Migrations (Walserwanderungen); see Bohnenberger (1913) and Wiesinger (1983a: 904). Hence, the dialect described by Brun (1918) is one variety of Walser German (Walderdeutsch). Obersaxen is a unique dialect because it is a German-language island (Wiesinger 1983a) completely surrounded by areas in which a Romance language is the dominant tongue (Romansh). See §15.6 for further discussion.

In his discussion of the sounds of Walser German, Bohnenberger (1913: 173) observes that /kx/ and /x/ are realized as palatal depending on the nature of the preceding vowel. It is tempting to interpret Bohnenberger's observation as evidence that Walser German as a whole is characterized by velar fronting. The problem with this interpretation is twofold. First, not all varieties of Walser German have velar fronting (e.g. Schanfigg; Kessler 1931; Footnote 3.2). Second, varieties of

Walser German with velar fronting do not have the same rule (see Chapter 15 for discussion).

Although Obersaxen is shown below to possess a neutral vowel and is hence structurally similar to Visperterminen (Wipf 1910; §6.2), it needs to be stressed that the two SwGm varieties are spoken in different cantons and that they are therefore separated by conservative non-velar fronting varieties. Neutral vowels in Visperterminen and Obersaxen therefore developed independently.

I consider first the phonetics/phonology of the vowels (§6.3.1) and then the patterning of dorsal fricatives and affricates (§6.3.2).

6.3.1 Phonetics and phonology of vowels

Obersaxen possesses front vowels (/i y yː e eː æ æː/), back vowels (/u o oː ɑ ɑː ə/), and six diphthongs (/æʊ ʊæ ʏu æɪ ɪæ ɪi/).[9] The diphthongs are placed into two categories based on how they behave with respect to Umlaut: /æʊ ʊæ ʏu/ bear [peripheral] and /æɪ ɪæ ɪi/ [coronal]; see below for representations. The most important diphthong for present purposes /ʏu/, whose phonetically front component /ʏ/ is shown below to be a neutral vowel, cf. the equivalent diphthong in Visperterminen /yo/.

Vocalic alternations involving Umlaut are essentially the same as in Visperterminen: Back monophthongs alternate with the corresponding front unrounded monophthongs (in 35a); front rounded monophthongs surface in the context of Umlaut as the corresponding front unrounded monophthongs (as in 35b); and diphthongs exhibit the pattern of alternation in (35c).

(35) a. [u]~[i]
[o]~[e]
[oː]~[eː]
[ɑ]~[æ]
[ɑː]~[æː]
b. [yː]~[iː]
[y]~[i]
c. [ʊæ]~[ɪæ]
[æʊ]~[æɪ]
[ʏu]~[ɪi]

[9] Three surface monophthongs are ignored, namely [ɪ ø ɛ]. [ø ɛ] only occur rarely (Brun 1918: 45, 67) and apparently never in the context of a dorsal fricative or affricate. [ɪ] is a stressless allophone of /i/. Two diphthongs are not considered below ([ɪə ʊə]) because they do not occur in the neighborhood of dorsal fricatives or affricates.

The three patterns in (35) are illustrated in (36a-c). The morphological contexts for Umlaut in these examples are the comparative or superlative of adjectives, the plural of nouns and the derivational suffixes [-ər] and [-lɪçç]. Synchronic alternations involving the pair [ʏu]~[ɪi] in (35c) are difficult to come by; a crucial example involving that pair of diphthongs as it interacts with the distribution of dorsal fricatives is discussed in §6.3.2.

(36)	a.	ksunt	[ksunt]	gesund	'healthy'	61
		ksintər	[ksindər]	gesünder	'healthier'	61
		grop	[grop]	grob	'rough'	61
		grebər	[grebər]	gröber	'rougher'	61
		grōss	[gro:ss]	groß	'large'	160
		grēšt	[gre:ʃt]	größt-	'largest'	160
		štɑrxx	[ʃtɑrxx]	stark	'strong'	160
		štærxšt	[ʃtærxʃt]	stärkst-	'strongest'	160
		nɑt	[nɑ:t]	Naht	'seam'	57
		nǣtlɩ	[næ:tlɪ]	Naht, dim	'seam-DIM'	57
	b.	fǖšt	[fy:ʃt]	Faust	'fist'	155
		fīšt	[fi:ʃt]	Fäuste	'fists'	155
		hüt	[hyt]	Haut	'skin'	75
		hittæ	[hittæ]	häuten	'skin.INF'	75
	c.	šuæl	[ʃʊæl]	Schule	'school'	55
		šiælər	[ʃɪælər]	Schüler	'student'	66
		glæubæ	[glæʊbæ]	glauben	'believe.INF'	81
		uŋklæɪplɩχχ	[uŋklæɪplɪçç]	unglaublich	'unbelievable'	63

Front unrounded monophthongs are nonneutral and hence [coronal]; see (7a), while back monophthongs are [peripheral]; see (7c). The correct representation for front rounded monophthongs is (7b). Individual monophthongs are assigned distinctive features, as indicated in Table 6.2. In contrast to Visperterminen (= Table 6.1), [low] must be assigned before [high] so that high and mid front vowels all bear the feature [−low]. [peripheral] is assigned twice, depending on whether or not it corresponds to the backness or the roundedness dimension.

The featural representations for the six diphthongs are presented in (37). Note that both components of those diphthongs bear either a positive or negative specification of the feature [high]. The feature [high], together with the place features [coronal] and [peripheral] suffice to make all six diphthongs distinct. For that reason, the feature [±low] is redundant, as is [±tense]. The fact that certain components of the diphthongs are phonetically lax and others are phonetically tense is captured in the phonetics and not in the phonology.

Table 6.2: Distinctive features for vowels (Obersaxen)

	i	yː y	eː e	æː æ	u	oː o	ɑː ɑ
[coronal]	✓	✓	✓	✓			
[peripheral]					✓	✓	✓
[low]	−	−	−	+	−	−	+
[high]	+	+	−	−	+	−	−
[peripheral]		✓					

(37) a. /æʊ/

$$\begin{bmatrix}-\text{CONS}\\-\text{HIGH}\end{bmatrix}\quad\begin{bmatrix}-\text{CONS}\\+\text{HIGH}\end{bmatrix}$$

$$\begin{bmatrix}\text{PERIPHERAL}\end{bmatrix}$$

b. /æɪ/

$$\begin{bmatrix}-\text{CONS}\\-\text{HIGH}\end{bmatrix}\quad\begin{bmatrix}-\text{CONS}\\+\text{HIGH}\end{bmatrix}$$

$$\begin{bmatrix}\text{CORONAL}\end{bmatrix}$$

c. /ʊæ/

$$\begin{bmatrix}-\text{CONS}\\+\text{HIGH}\end{bmatrix}\quad\begin{bmatrix}-\text{CONS}\\-\text{HIGH}\end{bmatrix}$$

$$\begin{bmatrix}\text{PERIPHERAL}\end{bmatrix}$$

d. /ɪæ/

$$\begin{bmatrix}-\text{CONS}\\+\text{HIGH}\end{bmatrix}\quad\begin{bmatrix}-\text{CONS}\\-\text{HIGH}\end{bmatrix}$$

$$\begin{bmatrix}\text{CORONAL}\end{bmatrix}$$

e. /ʏu/

$$\begin{bmatrix}-\text{CONS}\\+\text{HIGH}\end{bmatrix}\quad\begin{bmatrix}-\text{CONS}\\+\text{HIGH}\end{bmatrix}$$

$$\begin{bmatrix}\text{PERIPHERAL}\end{bmatrix}$$

f. /ɪi/

$$\begin{bmatrix}-\text{CONS}\\+\text{HIGH}\end{bmatrix}\quad\begin{bmatrix}-\text{CONS}\\+\text{HIGH}\end{bmatrix}$$

$$\begin{bmatrix}\text{CORONAL}\end{bmatrix}$$

Given the structures for monophthongs in (7) and diphthongs in (37), Umlaut is expressed as in (11).

6.3.2 Dorsal fricatives and affricates

Obersaxen has two singleton dorsal fricatives, namely [x] (=⟦x⟧) and [ç] (=⟦χ⟧), which also have geminate counterparts [xx] (=⟦xx⟧) and [çç] (=⟦χχ⟧). In contrast to Visperterminen, geminates can occur in Obersaxen after a long vowel. The basic facts involving the distribution of dorsal fricatives and affricates in Obersaxen are very similar – but not identical – to the facts for Visperterminen. The reader is referred to the detailed discussion in the original source (Brun 1918: 113–118; 121–122). The relationship between the velars and corresponding palatals is depicted in (14) for word-initial and postsonorant position.

The distribution of the velar and palatal sounds in question is summarized in (38) and (39):

(38) [x]/[kx] and [ç]/[kç] in word-initial onsets:

a. [ç] occurs word-initially only before nonlow front vowels but not before [ʏu];
b. [x] occurs word-initially in the elsewhere case (including [ʏu]);
c. [kç] and [kx] have the same distribution as word-initial [x]/[ç].

(39) [x]/[kx] and [ç]/[kç] after a sonorant:

a. [ç] occurs after a nonlow front vowel;
b. [x] occurs after other vowels (including [ɪæ]);
c. [ç] occurs after a nonlow front vowel followed by a liquid;
d. [x] occurs after any other vowel followed by a liquid;
e. [kç] and [kx] have the same distribution as [x]/[ç].

There are two crucial differences between Obersaxen and Visperterminen: First, in Visperterminen palatals occur in the neighborhood of a [+high] coronal, but in Obersaxen palatals surface when adjacent to a [−low] sound. Second, in Obersaxen, [x] surfaces after the diphthong [ɪæ], but in Visperterminen, palatal [ç] surfaces after the equivalent diphthong ([iæ]).

In word-initial position, [ç] occurs before a nonlow front vowel (=38a). The vowel referred to here can be [i] (in 40a), [yː] (in 40b), [e] (in 40c), [eː] (in 40d) or [ɪæ] in (40e). No examples with a word-initial dorsal fricative were found in Brun (1918) in which the vowel following that fricative is [y] or [ɪi] – gaps I interpret as accidental. The dorsal fricatives and affricates in (40) and subsequent datasets derive historically from WGmc ⁺[k] or ⁺[x].

(40) Word-initial [ç] (from /x/):

a.	χint	[çint]	Kind	‘child’	113
b.	χǖχχlæ	[çyːççlæ]	Kunkel	‘explosive pellet’	113
c.	χegəl	[çegəl]	Kegel	‘pin’	113
d.	χēl	[çeːl]	Kohl	‘cabbage’	47
e.	χɪæholts	[çɪæholts]	Kienholz	‘resinous wood’	54

As shown in (41), before any other segment, the word-initial dorsal fricative surfaces as [x] (=38b). Thus, word-initial [x] occurs before a back vowel (in 41a), a nonhigh front vowel in the diphthongs [æu] and [æi] (in 41b), or the diphthong [ʏu] (in 41c). The latter example is the crucial one because [ʏ] is a high front vowel and, as such, would be expected to pattern like the examples in (40). Thus, surface sequence of velar followed by [ʏu] exemplifies underapplication.

(41) Word-initial [x] (from /x/):

a.	xunšt	[xunʃt]	Kunst	'art'	113
	xopf	[xopf]	Kopf	'head'	113
	xɑlt	[xɑːlt]	kalt	'cold'	61
b.	xæuwæ	[xæʊwæ]	kauen	'chew.INF'	113
	xæisər	[xæɪsər]	Kaiser	'emperor'	113
c.	xüuwæ	[xʏuwæ]	Kuh	'cow'	113

In Brun's (1918: 113) description of the distribution of word-initial [x] and [ç], he writes that the former sound occurs before the vowels [ɑ o u æ æɪ æʊ ʏu] and the palatal before [i y e ɪæ]. ["Velare Spirans x……vor den Vokalen *a o u æ æi æu* und *üu*"; "Palatale χ……vor den Palatalvokalen *i u ιæ ṻ*".] Note in particular that Brun classifies the front part of the diphthong [ʏu] with the back vowels and the nonlow front vowels.

The examples in (42) indicate that [x] – but not [ç] – occurs in word-initial position before a coronal sonorant consonant, which can be [n] (in 42a), [l] (in 42b) or [r] (in 42c). The second example in (42a) illustrates that the realization of the word-initial dorsal is not determined by the vowel following /r/.

(42) Word-initial [x] (from /x/):

a.	xnæu	[xnæu]	Knie	'knee'	113
	xnæxt	[xnæxt]	Knecht	'vassal'	34
b.	xrɑnts	[xrɑnts]	Kranz	'wreath'	113
	xrits	[xrits]	Kreuz	'cross'	113
c.	xlɑr	[xlɑːr]	klar	'clear'	113
	xlæppæræ	[xlæppæræ]	klappern	'rattle.INF'	113

The umlaut alternations in (43a) trigger a change from velar [x] to palatal [ç] before a nonlow front vowel. The same vocalic change occurs in the pair in (43b). Note that the diphthong in the singular noun is the neutral vowel [ʏu], which is preceded by a surface velar [x]. The fronted counterpart of that neutral vowel is [ɪi] in the plural noun, which is preceded by a surface palatal [ç] because [ɪi] is a nonneutral vowel.

(43) Dorsal fricatives (from /x/) before umlaut alternations:

a.	xɑlt	[xɑːlt]	kalt	‘cold’	61
	χeltər	[çeltər]	kälter	‘colder’	61
b.	xüuwæ	[xʏuwæ]	Kuh	‘cow’	155
	χɩijæ	[çɪijæ]	Kühe	‘cows’	155

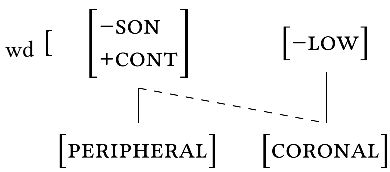
Word-initial velar and palatal affricates showing the same distribution as the corresponding fricatives are presented in (44); recall (38c). Brun (1918: 113) is clear that the distribution of word-initial dorsal affricates is the same as the distribution of the corresponding fricatives.

(44) Word-initial affricates (from /kx/):

a.	kχits	[kçits]	Werg	‘oakum’	114
b.	kxuntæ	[kxuntæ]	Rechnung	‘bill’	38
	kxæuffæ	[kxæʊffæ]	kaufen	‘buy.INF’	38

In word-initial position velars and palatals do not contrast. As indicated above, I analyze the underlying sound as velar (/x/ or /kx/), which shifts to the corresponding palatal before a [−low] vowel by (45). No native words begin with [k], although a small number of apparently integrated loanwords have [k] in that context, e.g. [kiŋklæ] ‘rabbit’. Since word-initial [k] is not realized as palatal before nonlow front vowels, the set of targets for (45) consists of fricatives and affricates only (=23a).

(45) Wd-Initial Velar Fronting-5:



Wd-Initial Velar Fronting-5 fails to spread [coronal] from a consonant (/r l n/) to a preceding /x/ in (42) because [±low] is not distinctive for consonants. Hence, word-initial /x/ in (42) surfaces in those items without change as [x].

The distribution of velar and palatal fricatives after a vowel (=39a-d) is shown in (46): Palatals surface after a nonlow front vowel (in 46a), while velars occur after a low front vowel (in 46b) or a back vowel (in 46c). The examples in (46d) exhibit the occurrence of velar fricatives after the diphthong [ɪæ].[10]

[10] The discussion in Brun (1918: 114) is clear that palatals only surface after the vowels I analyze as

(46) Postvocalic dorsal fricatives (from /x/):

a.	rīχχ	[ri:çç]	reich	‘rich’	46
	ksiχt	[ksiçt]	Gesicht	‘face’	121
	rǣtɪχ	[ræ:tɪç]	Rettig	(unclear gloss)	44
	χeχχ	[çeçç]	Köche	‘cooks’	116
	sēχtæ	[se:çtæ]	Wäsche in die Lauge legen ‘put.INF wash in lye’		45
b.	fæxtæ	[fæxtæ]	fechten	‘fence.INF’	121
c.	bruxx	[bruxx]	Bruch	‘fracture’	39
	loxx	[loxx]	Loch	‘hole’	37
	bɑxx	[bɑxx]	Bach	‘stream’	116
	dɑx	[dɑ:x]	Docht	‘wick’	43
	ræuxx	[ræuxx]	Rauch	‘smoke’	116
d.	sɪæxx	[sɪæxx]	krank	‘sick’	54
	ərnɪæxtæræ	[ərnɪæxtæræ]	Schnapps	‘kind of Schnapps’	55

Note in particular the data in (46d): [ɪæ] is followed by a velar fricative in contrast to the data from (25h) indicating that a palatal fricative follows [iæ] in Visperterminen.

The Umlaut alternations in (47) indicate that [x] surfaces after a back vowel in the singular but that [ç] occurs after the fronted (nonlow) vowel in the plural.

(47) Dorsal fricatives (from /x/) after fronted vowels:

a.	fruxt	[fruxt]	Frucht	‘fruit’	155
b.	friχt	[friçt]	Früchte	‘fruits’	155

The examples in (48) show that velar and palatal affricates have a parallel distribution to the corresponding fricatives (=39e). Thus, palatal [kç] surfaces after a [−low] front vowel (in 48a) and velar [kx] after any other vowel (in 48b).

(48) Postvocalic dorsal affricates (from /kx/):

a.	glikχ	[glikç]	Glück	‘fortune’	116

nonlow. In the context of that discussion the author notes a complication: If a dorsal fricative occurs between a low front vowel and /ɪ/, then the fricative in question is fronted, e.g. the /xx/ in the word /ʃtæxxɪk/ ‘malicious’. I do not take that type of example into consideration below because I see the fronted articulation of /xx/ as the product of a coarticulatory fronting and not of a discreet phonological process. Brun himself notes that the fronted dorsal fricative in words like /ʃtæxxɪk/ is articulatorily between velar and palatal.

b.	štukx	[ʃtukx]	Stück	'piece'	42
	špækx	[ʃtækx]	Speck	'bacon'	116

Postvocalic velars and palatals are derived from /x/ or /kx/ after a [−low] front vowel by (49). As in word-initial position, the target for postsonorant fronting in (49) does not include /k/, e.g. [ek] 'corner'.

(49) Velar Fronting-7:

$$\begin{array}{ccc} [-\textsc{low}] & & \begin{bmatrix}-\textsc{son}\\ +\textsc{cont}\end{bmatrix} \\ | & & \vdots \\ [\textsc{coronal}] & & [\textsc{peripheral}] \end{array}$$

The examples in (46d) indicate that the dorsal fricative surfaces as velar after the diphthong /ɪæ/, e.g. /sɪæxx/⟶[sɪæxx] 'sick'. The reason [coronal] cannot spread from the diphthong /ɪæ/ to /x/ is that the trigger for fronting (Velar Fronting-7) is [−low]. Recall from (39) – in particular (39d) – that the two components of the six diphthongs are distinguished from one another with the positive or negative value of the feature [high] alone (together with [coronal] and or [peripheral]), but that [low] is not a distinctive feature for diphthongs.

I consider now the distribution of the dorsal fricatives after a consonant (=39c,d). In (50) I show that the palatal [ç] occurs after a liquid if the immediately preceding vowel is nonlow and front. In (50a) the liquid in question is [l] and in (50b) it is [r].

(50) Postliquid dorsal fricatives (from /x/):

a.	milχχ	[milçç]	Milch	'milk'	37
	χelχχ	[çelçç]	Kelch	'chalice'	32
b.	mælxx	[mælxx]	leicht zu melken	'easy to milk'	116
c.	xɑlxx	[xɑlxx]	Kalk	'lime'	37

Front vowel plus liquid sequences undergo Coalescence-1 (=34). In (50a) Velar Fronting-7 applies because the front vowel is [−low], e.g. /milxx/⟶[milçç] 'milk'. Since the vowel preceding the liquid is not front in (50c) Coalescence-1 does not apply, and the dorsal fricative surfaces as velar, e.g. /xɑlxx/⟶[xɑlxx] 'lime'. In (50b) the front vowel plus liquid sequence undergoes Coalescence-1, but the dorsal fricative after the liquid fails to undergo Velar Fronting-7 because the front vowel does not bear the feature [−low], e.g. /mælxx/⟶[mælxx] 'easy to milk'.

6.4 Emergence of neutral vowels

As noted above, neutral vowels were historically back. The change from an original back sound to the neutral structure in (1b) exemplifies Vowel Fronting, which requires the deletion of the feature characterizing back sounds ([peripheral]) but crucially not the addition of the front vowel feature ([coronal]). That type of change is depicted in (51a) in the context before a velar and in (51b) in the context after a word-initial velar. Vowel Fronting – depicted here as /ɑ/ > /i/ – deleted the [peripheral] feature from the back sound. The significant point is that the frontness feature ([coronal]) was not added to the new front vowel /i/, which is the neutral vowel represented in (1b). (51) depicts both underlying and surface representations, which are the same.

(51) a.

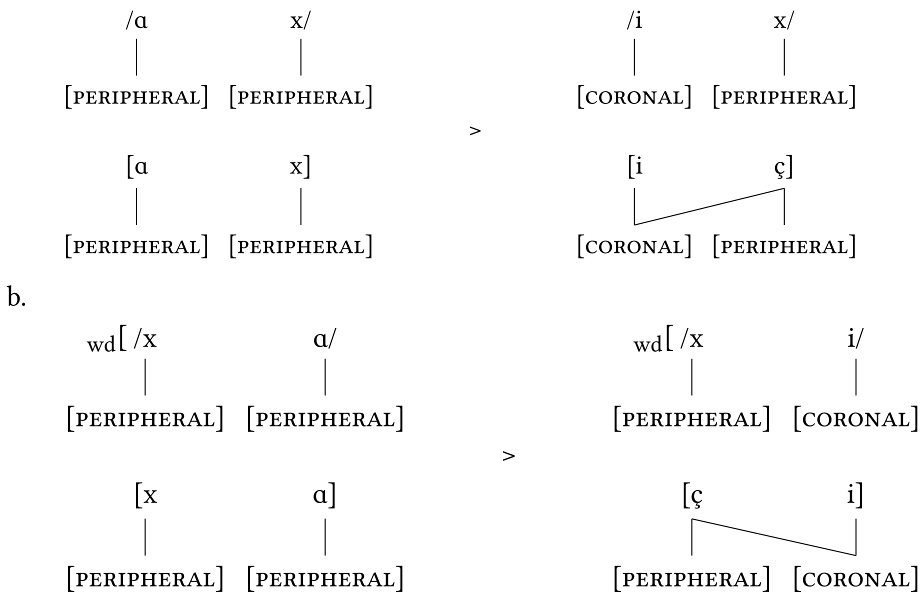
/ɑ	x/		/i	x/
|	|			|
[PERIPHERAL]	[PERIPHERAL]	>		[PERIPHERAL]
[ɑ	x]		[i	x]
|	|			|
[PERIPHERAL]	[PERIPHERAL]			[PERIPHERAL]

b.

$_{wd}$[/x	ɑ/		$_{wd}$[/x	i/
|	|		|	
[PERIPHERAL]	[PERIPHERAL]	>	[PERIPHERAL]	
[x	ɑ]		[x	i]
|	|		|	
[PERIPHERAL]	[PERIPHERAL]		[PERIPHERAL]	

In some of the examples from Visperterminen and Obersaxen presented earlier, Vowel Fronting involves not simply the deletion of [peripheral] from the original back vowel, but also the addition of [coronal] to those new front vowels, thereby creating the nonneutral representation in (1a). That type of vocalic change is depicted in (52a) for the context before a velar (/x/) and in (52b) for the context after a word-initial velar (/x/). Note that Vowel Fronting – represented here as /ɑ/ > /i/ – feeds velar fronting because the new front vowel created by the former (/i/) serves as a trigger for the latter.

(52) a.



I consider now three representative words in (53) from Visperterminen for the two types of Vowel Fronting. Examples (53a,b) exhibit the emergence of neutral vowels (=51) and the one in (53c) of nonneutral vowels (=49). The reconstructed forms in the second column are my own.

(53)	a. [xyo]	<	+[xuo]	‘cow’	cf. OHG *kuo*	(from 18c)
	b. [røix]	<	+[rouh]	‘smoke’	cf. OHG *rouh*	(from 26i)
	c. [by:ç]	<	+[bu:x]	‘stomach’	cf. OHG *būh*	(from 25c)

Since Vowel Fronting is simply a cover term for any change from any etymological back vowel to any type of vowel that loses the backness feature, there is no reason to assume that the vocalic the changes in (53) were necessarily coterminous. In fact, I show that the changes creating neutral vowels in (53a,b) probably came about later than ones creating nonneutral structures as in (53c).

The vocalic changes in (53a,b) are expressed formally in (54). The featural structure to the left of the wedge in (54) captures the two original diphthongs, which consisted of back vowels (/ou, uo/). According to Neutral Vowel Formation the feature [dorsal] is replaced with [peripheral] and additional features are added to the two components, namely [−nasal] and the height features [±high] and [±low], which are represented in (54) with the two variables [αF] and [αG]. The crucial aspect of the change is that the second component of the diphthongs to the right of the wedge does not acquire the feature [coronal]. Neutral Vowel Formation in (54) can be compared with Coronalization in (55), which is required for example (53c); recall Map 2). That change also involves a replacement of [dorsal] with [peripheral], but crucially the structure to the right of the wedge acquires the feature [coronal].

(54) Neutral Vowel Formation:

/ou/, /uo/ > /øi/, /yo/

$$\begin{array}{cc} [-\text{CONS}] & [-\text{CONS}] \\ \multicolumn{2}{c}{[\text{DORSAL}]} \end{array} \quad > \quad \begin{array}{cc} \begin{bmatrix} -\text{CONS} \\ -\text{NAS} \\ \alpha\text{F} \end{bmatrix} & \begin{bmatrix} -\text{CONS} \\ -\text{NAS} \\ \alpha\text{G} \end{bmatrix} \\ | & \\ [\text{PERIPHERAL}] & \end{array}$$

(55) Coronalization:

/uː/ > /yː/

$$\begin{array}{c} \begin{bmatrix} -\text{CONS} \\ +\text{HIGH} \end{bmatrix} \\ | \\ [\text{DORSAL}] \end{array} \quad > \quad \begin{array}{cc} \multicolumn{2}{c}{\begin{bmatrix} -\text{CONS} \\ +\text{HIGH} \end{bmatrix}} \\ [\text{CORONAL}] & [\text{PERIPHERAL}] \end{array}$$

In (56) I provide the three examples from (53) as well as the word [weiç] 'soft' (from 25d). The first and third items represent the neutral vowels [yo] and [øi], the second example shows a high front nonneutral vowel deriving from a historical back vowel, and the fourth example illustrates an inherited high front nonneutral vowel ([i] in [ei]). At Stage 1 velars surfaced without change as velars. Stage 2 reflects the point where velar fronting was phonologized as an allophonic (transparent) process, and Stage 3 represents the dialect as it was described by Elisa Wipf in 1910. The subscripts indicate whether or not the segment in question is peripheral ("p"), dorsal ("d") or coronal ("c"). I assume that all instantiations of [dorsal] at Stage 2 changed to [peripheral] at Stage 3.

(56)	/x$_{d}$u$_{d}$o$_{d}$/	/bu:$_{d}$x$_{d}$/	/ro$_{d}$u$_{d}$x$_{d}$/	/we$_{c}$i$_{c}$x$_{d}$/	
	[x$_{d}$u$_{d}$o$_{d}$]	[bu:$_{d}$x$_{d}$]	[ro$_{d}$u$_{d}$x$_{d}$]	[we$_{c}$i$_{c}$x$_{d}$]	Stage 1
	/x$_{d}$u$_{d}$o$_{d}$/	/by:$_{c}$x$_{d}$/	/ro$_{d}$u$_{d}$x$_{d}$/	/we$_{c}$i$_{c}$x$_{d}$/	
	[x$_{d}$u$_{d}$o$_{d}$]	[by:$_{c}$ç$_{cd}$]	[ro$_{d}$u$_{d}$x$_{d}$]	[we$_{c}$i$_{c}$ç$_{cd}$]	Stage 2
	/x$_{p}$y$_{p}$o$_{p}$/	/by:$_{cp}$x$_{p}$/	/rø$_{p}$ix$_{p}$/	/we$_{c}$i$_{c}$x$_{p}$/	
	[x$_{p}$y$_{p}$o$_{p}$]	[by:$_{cp}$ç$_{cp}$]	[rø$_{p}$ix$_{p}$]	[we$_{c}$i$_{c}$ç$_{cp}$]	Stage 3
	Kuh	*Bauch*	*Rauch*	*weich*	MoStGm
	‘cow’	‘stomach’	‘smoke’	‘soft’	

Coronalization created a front (nonneutral) vowel from a historical back vowel in [by:ç] When that restructuring occurred (=Stage 2), the new front vowel fed velar fronting, which created a palatal that was fully transparent. By contrast, the examples [xyo] and [røix] exemplify the historical underapplication of velar fronting. In particular, at Stage 3 Neutral Vowel Formation converted the historical back vowels in those examples to diphthongs containing neutral vowels.

In §2.5 I posited a historical model which involves the interaction between speakers and listeners in acquisition. Consider how that approach accounts for the emergence of neutral vowels in (56). At Stage 2 the speaker (P_1) utters words like [weiç] (from /weix/) and [roux] (from /roux/). At Stage 3 the listener (P_2) correctly hears [weiç] and – on the basis of similar examples with [ç] and [x] – deduces that the underlying representation is /weix/ with a rule of velar fronting. By contrast, the diphthong in [roux] is misperceived as a diphthong consisting of a front component ([ø]) followed by a high vowel that is no longer back but also not as front as the second component of [ei]. The second part of the new diphthong is therefore misperceived as something other than [i]. I speculate that when the change from /ou/ to /øi/ was phonologized the new diphthong was probably pronounced as [øi̠], where [i̠] represents a slightly retracted [i]. But the change from Stage 2 to Stage 3 did not simply involve P_2's misperception and pronunciation of that new vowel. It also crucially entailed the interpretation of that vowel in phonological units as one which is neither front nor back, but instead neutral, as in (54). In 1910 when Elisa Wipf published her book on the sounds of Visperterminen the second component of [ei] and [øi] had fallen together; hence, at that point there was no longer a phonetic difference between the [i] in [ei] and the [i̠] in [øi̠], but the unique phonological representation in (54) was retained.[11]

[11]If the second component of [ei] and [øi] are now truly the same then it needs to be clarified

6.5 Discussion

6.5.1 Alternative analyses

Recall from §2.4.2 that there is precedence in the cross-linguistic literature for neutral vowels. The example discussed in that section (Dresher 2009) involved Barrow Inupiaq, which has both a nonneutral, Palatalization-triggering /i/, as well as a neutral, Palatalization-inhibiting /i/. In present terms, the former /i/ is marked phonologically for the feature that spreads in Palatalization ([coronal]), while the neutral /i/ does not have that feature. Significantly, neutral /i/ derived historically from a back vowel.

The material from Barrow Inupiaq lends strong support to the analysis of the two SwGm varieties discussed in this chapter because it establishes a precedence for the two representations in (1). In spite of that independent evidence one might claim that coronalless structures like the one in (1b) can be eschewed by adopting an alternative analysis. I discuss and reject three such alternatives below.

The weakest alternative to (1b) (Analysis A) is to assert that velars like [x] and palatals like [ç] are phonemes and to deny that there are any processes fronting the former to the latter. If /x/ and /ç/ – as well as the corresponding affricates – are phonemic, then one might assume that representations like (1b) are superfluous. Analysis A is untenable because velars and palatals never contrast in either of the HstAlmc varieties discussed above. For example, in Visperterminen postvocalic [ç] occurs only after any high front vowel with the exception of the [i] in [øi], but [x] surfaces only after back vowels and the [i] in [øi]. [x] and [øi] are therefore allophones according to any definition. That point aside, the reader should recall that (1b) derives independent support from Umlaut alternations.

A second alternative to (1b) (Analysis B) is to derive palatals from the corresponding velars with versions of velar fronting which simply list the segmental triggers. For example, Analysis B would state Wd-Initial Velar Fronting-4 and Velar Fronting-6 as in (57). An analysis along these lines is endorsed by Anderson (1981: 509–511), who endorses a synchronic rule of velar fronting in Icelandic that is triggered by a list of segments and not a set of features.

(57) Alternative rules (rejected):

a. /x kx/ ⟶ [ç kç] / $_{\text{wd}}$ [___ /i iː iæ ỹː/

how generations of Visperterminen listeners since 1910 have correctly acquired phonological representations with neutral vowels. I hypothesize that there remains a very subtle difference between the [i] in [ei] and the [i] in [øi] to the present day which serves as a cue to language learners that only the first but not the second serves as a trigger for velar fronting. Future work on Visperterminen can (dis)confirm my hypothesis.

b. /x kx/ ⟶ [ç kç] / /i iː yː ei iæ ĩː ỹː ẽi/ __

The crucial difference between (57) and the rules of fronting posited above is that the rules in (57) are not expressed in terms of features. For example, (57a) is triggered by the four vowels /i iː iæ ỹː/ but not by the high front vowel /y/ in the diphthong /yu/ because /yu/ is not included in the list of triggers. Likewise (57b) applies after the vowels /i iː yː ei iæ ĩː ỹː ẽi/ but not after the /i/ in the diphthongs /øi/. Given that palatals are derived when adjacent to an arbitrary list of vowels – and not to a natural class expressed in terms of features – there is no need to analyze neutral vowels as placeless. Thus, the /y/ in /yo/ and then /i/ in /øi/ and /ɑi/ can be analyzed as [coronal].

A number of criticisms can be directed towards Analysis B. Observe that the treatment's rejection of neutral vowels comes at the expense of relying on rules that do not apply to a natural class. That contrasts with velar fronting in all of the other German dialects investigated in this book. A more serious drawback is that it is not clear how Analysis B accounts for the vocalic alternations described in §6.2.2 and §6.3.2.

A third alternative to (1b) (Analysis C) is to treat the aberrant words as lexical exceptions. On that analysis, the reason [x] surfaces in a word in Visperterminen like [øix] 'also' is not because the /i/ has a coronalless representation, but instead because of the specific morpheme in which the sounds in question occur.

Analysis C can therefore be thought of as a morpheme-based analysis, which contrasts with the present treatment (a vowel-based analysis). There are two arguments against the former approach.

First, Analysis C cannot explain why the exceptional velars only surface in the neighborhood of the same vowels. For example, word-initial [x] surfaces not only in the morpheme [xyo] 'cow', but also in all other morphemes containing [yo]. But [x] fails to surface in word-initial position before other high front vowels. The same points hold for the [x] in Visperterminen examples like [røix] 'smoke'. The fact that opaque velars occur only in the context of certain high front vowels but not in the context of others is captured directly by the vowel-based approach, but the facts are coincidental in the morpheme-based treatment.

Second, if morphemes were marked as exceptional then there would be no explanation for Umlaut alternations. For example, the morpheme 'cow' surfaces in Visperterminen as [xyo] in the singular, but the plural is [çiæ]. The morpheme [bɑ̃ix] 'bank' likewise surfaces with the palatal [ç] in the plural (i.e. [bẽiç]). The change from [x] to [ç] in these examples makes sense given my treatment (which is vowel-based) because the [y] in [yo] and the [i] in [ɑ̃i] but not the [i] in [iæ] or [ẽi] are neutral vowels. But if morphemes and not vowels were marked as exceptions as per Analysis C, there would be no explanation for the fact that the same morpheme sometimes obeys the rule and other times does not.

6.5.2 Directionality

Reference was made to a directionality parameter in the typological literature on velar palatalization (§2.3.5). Thus, the works cited in that section demonstrate that velar palatalization can apply either regressively (right to left) or progressively (left to right). A hypothetical example illustrating regressive palatalization is /ɑki/⟶[ɑci] and progressive palatalization is /ikɑ/⟶[icɑ]. Both choices are attested in the languages of the world, although there is a clear preference for regressive spreading.

The directionality parameter has not been discussed in the context of velar fronting in German dialects because postsonorant velar fronting always applies from left to right, cf. MoStGm [kuːxən] 'cake' vs. [kʏçə] 'kitchen'. In these items it can be seen that the trigger for velar fronting (e.g. /ʏ/) is to the immediate left of the target (/x/). The reason the trigger cannot be the vowel to the right of the target is that that vowel is always schwa (/ə/) in native words. Schwa cannot trigger the spreading of the frontness feature because it is not a front vowel. Recall that schwa in examples like [kuːxən] 'cake' vs. [kʏçə] 'kitchen' was etymologically a full vowel (cf. OHG *kuohho* 'cake', OHG *kuhhina* 'kitchen') which underwent Vowel Reduction. MoStGm also has many nonnative words (including names) in which the velar fronting target (/x/) is between two full vowels (Appendix G). e.g. [ɛço] 'echo', *Achim* [ɑxɪm] '(name)'. The reason MoStGm tolerates words like these with full vowels in unstressed syllables is that Vowel Reduction is no longer active synchronically. More to the point, examples like [ɛço] and [ɑxɪm] confirm that velar fronting spreads the frontness feature progressively and not regressively. Nonnative words like these are not considered in this book because they are usually not discussed in the original sources.

The topic of directionality is relevant in this chapter because Vowel Reduction never occurred in Visperterminen (recall §6.2.1) and only applied to a limited extent in Obersaxen. Hence – in contrast to all other dialects of German – potential triggers for velar fronting can be present in both of those SwGm varieties after the targets even in native words. Four representative examples from Visperterminen with velar fronting targets (/x/ and /kx/) situated between two full vowels are repeated in (58). Words like these confirm that spreading is progressive. Thus, in (58a) the (high front) vowel to the left of the target is a trigger, while the (back) vowel to the right of that target is not a trigger. However, the vowel to the right of the target (/xx/) in (58b) is high and front, while the vowel to the left of the trigger in those words is not high and front. Since the target /xx/ surfaces without change as velar in (58b) it can be concluded that velar fronting cannot spread the frontness feature from right to left. (Recall from Map 10 that the regressive spreading attested in Obersaxen is the result of coarticulatory fronting and not discreet phonological fronting).

(58)	a.	de̬iχu	[dẽiçu]	'think.INF'	(from 25g)
		bleikχu	[bleikçu]	'bleach.INF'	(from 28b)
	b.	xuxxi	[xuxxi]	'kitchen'	(from 18a)
		dexxi	[dexxi]	'blanket'	(from 26f)

The reason data like the ones in (58b) are significant is that they show velar fronting could potentially apply regressively in native words. Since outputs like *[xuççi] and *[deççi] are incorrect, velar fronting was phonologized in pre-Visperterminen as a rule applying progressively even though the opposite direction was available to native speakers. Interestingly, speakers of pre-Visperterminen did not opt for the preferred regressive direction. I return to the topic of directionality in the context of when velar fronting was phonologized in §16.5.

6.6 Conclusion

The two case studies discussed above have in common that they possess neutral vowels, which by definition are phonetically front but which lack the phonological feature [coronal]. From the historical perspective, neutral vowels were once back ([dorsal]) sounds that were restructured to neutral vowels when historical processes eliminated the backness feature (Vowel Fronting) failed to add the frontness feature [coronal]. The occurrence of velars like [x] in the neighborhood of those historical back vowels therefore exemplifies the historical underapplication of velar fronting.

This chapter and the preceding one have in common that they consider cases involving the synchronic and/or diachronic underapplication of velar fronting. The reason underapplication occurs is that there were changes eliminating the original backness feature ([dorsal]), but those changes (e.g. Vowel Fronting in the present chapter) failed to feed velar fronting. In the following three chapters I consider the consequences of changes eliminating the feature for historically front sounds ([coronal]) in the context of velars undergoing fronting. It is demonstrated in those chapters that the type of change referred to here (e.g. Vowel Retraction) led to a historical overapplication of velar fronting and opaque palatals in the neighborhood of front vowels.

7 Quasi-phonemicization of palatals

7.1 Introduction

In many German dialects palatals (e.g. [ç]) occur in the context of front vowels and certain back sounds ([Bk]) and velars (e.g. [x]) in the context of all back sounds with the exception of [Bk]. Palatal ([ç]) and velar ([x]) do not contrast because they stand in complementary distribution. All instances of palatals ([ç]) in the context of front vowels derive – both synchronically and diachronically – from the corresponding velar, but opaque palatals in the context of [Bk] are quasi-phonemes (/ç/). Significantly, palatal quasi-phonemes were once palatal allophones deriving from velars in the neighborhood of a front vowel (e.g. [ç] from /x/). When that original front vowel was eliminated, the palatal allophone was quasi-phonemicized to /ç/. This chapter investigates German dialects with palatal quasi-phonemes.

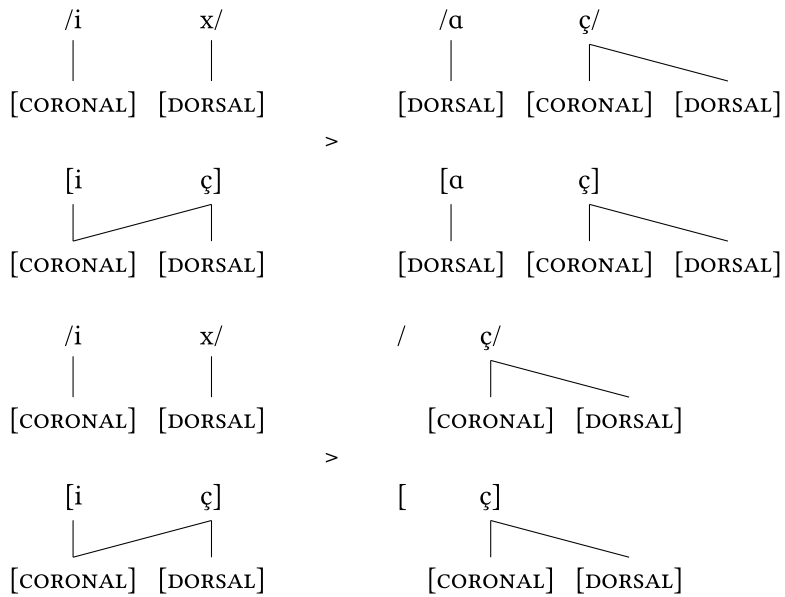
The way in which quasi-phonemes (opaque palatals) arise historically is illustrated in (1): Stage 1 (far left) depicts a system without velar fronting, and Stage 2 (middle) a system in which velar fronting is phonologized as a rule creating a palatal allophone ([Pa]); recall Figure 2.10. Stage 3 (far right) is one in which a quasi-phoneme is present (/Pa/). In Chapter 16 I discuss the time frame for the developments depicted in (1) and show how those changes fit into the early stages of German (Appendix E).

(1)	/Ve/	>	/Ve/		>	/Ve/	/Pa/
	[Ve]		[Ve]	[Pa]		[Ve]	[Pa]

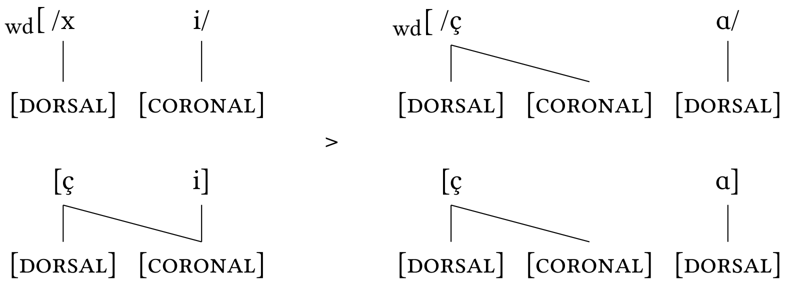
From the synchronic perspective there are two types of palatal [Pa] at Stage 3, although that distinction is not expressed in (1): (a) The synchronically derived palatal [Pa], which is the surface manifestation of underlying /Ve/, and (b) the underlying palatal quasi-phoneme [Pa] (/Pa/), which by definition cannot be synchronically derived from a velar. Derived palatals are situated in the context for velar fronting (e.g. after front vowels), while velars like [Ve] surface in the elsewhere case. Palatal quasi-phonemes like [Pa] (/Pa/) are found neither in the front vowel context, nor in the elsewhere context for velars. Thus, velars and palatals in the dialects described below do not contrast.

As indicated below, the palatal allophone at Stage 2 in (1) – depicted with the symbol [ç] – is quasi-phonemicized (/ç/) at Stage 3 when one of the triggers for velar fronting (/i/) is eliminated. Those opaque palatals therefore exemplify a historical overapplication of velar fronting. (2) illustrates quasi-phonemicization in the context after a sonorant (a front coronal) and (3) word-initially (before a front coronal). In (2) and (3) I indicate both the underlying representation and the phonetic representation.

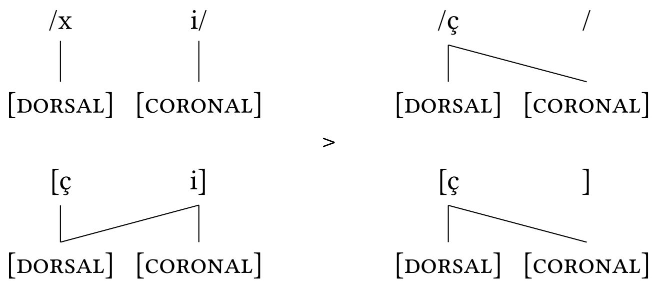
(2) a. b.



(3) a.



b.



The structure to the left of the wedge in (2) and (3) illustrates the stage in which velar fronting is present as an allophonic rule (=Stage 2). At that point velar fronting spreads [coronal] from the front segment (/i/) to an adjacent velar (/x/), thereby creating a palatal, i.e. a structure with both [coronal] and [dorsal]. The quasi-phoneme /ç/ is present to the right of the wedge (=Stage 3) in (2) and (3): In (2a) and (3a) the front vowel (/i/) is restructured to a back vowel (/ɑ/), a change requiring that the front vowel lose [coronal] and acquire [dorsal]. Crucially, the [coronal] feature in question is not deleted entirely, but instead it remains linked to the palatal. Since that palatal can no longer be derived synchronically from an adjacent front sound, it is present in the underlying representation. In (2b) and (3b) the palatal is quasi-phonemicized when the front vowel deletes.

As depicted in (2) and (3), palatal quasi-phonemes emerge when a sound that serves as trigger for velar fronting is no longer present. From the formal perspective, the change involves the deletion of the feature that is propagated in velar fronting, which in the present treatment is [coronal]. The quasi-phonemes in the case studies described below can arise from any of the four changes listed in (4), all of which restructure underlying representations. The first three sound changes were introduced in preceding chapters; Syncope is discussed below. The changes in (4) all have in common that they decrease the number of potential (front vowel) triggers for velar fronting (=Rule Z in Table 2.7).

(4) Sound changes which can delete [coronal]:

a. Vowel Retraction:

$/\left\{\begin{matrix}\text{front}\\\text{vowel}\end{matrix}\right\}/ > /\left\{\begin{matrix}\text{back}\\\text{vowel}\end{matrix}\right\}/$

b. r-Retraction:

/r/ > /ʀ/

c. Vowel Reduction:

$/\left\{\begin{matrix}\text{unstressed}\\\text{vowel}\end{matrix}\right\}/ > /\text{ə}/$

d. Syncope:

$/\left\{\begin{matrix}\text{unstressed}\\\text{vowel}\end{matrix}\right\}/ > \text{Ø}$

Vowel Retraction (§3.2) in (4a) is a cover term for the change from a front vowel to a back vowel. A formally similar change to (4a) is r-Retraction (§3.5) in (4b), which is responsible for the change from coronal /r/ to dorsal (uvular) /ʀ/. Vowel Reduction (§4.3) in (4c) is the change from any unstressed full vowel to schwa. Recall that full vowels bear place features, while schwa does not; hence, the change in (4c) involves the deletion of place features, including crucially [coronal] if the vowels in question are front. Although Vowel Reduction affected the vowel in both prefixes and in suffixes, the examples discussed below involve primarily the former, in particular the deletion of historical [i] in the *ge-* ([gə]) prefix of MoStGm (cf. OHG *gi-*, OSax *gi-*).[1] Syncope in (4d) entails the deletion of any vowel in an unstressed syllable. Significantly, if the vowel elided by (4d) is front (e.g. /i/), then [coronal] is lost. In the examples discussed below, Syncope affected a front vowel in the weak member of a trochaic foot (e.g. the second syllable in MoStGm [ˈhɑːbɪçt] 'hawk') or a front vowel in certain suffixes, e.g. the denominal adjective-forming *-ig* ([ɪç]) (cf. OHG *-ig*).

In the remainder of this chapter I present a series of brief case studies from German dialects possessing quasi-phonemes, i.e. either /ç/, /ʝ/ or both sounds. Those dialects can have the underlying and surface fricatives depicted in (5a) and/or (5b).

(5) a. /x/ /ç/ → [x] [ç]   b. /ɣ/ /ʝ/ → [ɣ] [ʝ]

	a.			b.	
(5)		/x/	/ç/	/ɣ/	/ʝ/
		|	|	|	|
		[x]	[ç]	[ɣ]	[ʝ]

In some systems the palatal quasi-phonemes depicted in (5) can be found word-initially, in others in postsonorant position, and yet in others they are attested in both contexts. The historical triggers for quasi-phonemes can be a coronal sonorant in any one of the changes listed in (4).

Data are presented in §7.2 and §7.3 from WLGm and CGm varieties with palatal quasi-phonemes. In §7.4 I discuss and reject various alternative treatments. §7.5 provides some discussion of the areal distribution of palatal quasi-phonemes. The chapter concludes in §7.6.

7.2 West Low German

Arens (1908) describes the Wph dialect of Elspe (Footnote 4.2). In that variety, [x] and [ç] do not contrast in word-initial position. In the context before a full

[1] That prefix is also attested in early OHG as *ga-*. Since the vowel [i] (but not the vowel [ɑ]) serves as a trigger for velar fronting, I conclude that the realization with [ɑ] could not have been the one from which [ə] derives in the dialects I discuss below; see §16.2 for discussion.

back vowel, [x] occurs (in 6a), while [ç] surfaces before a front vowel (in 6b) or a coronal sonorant consonant (in 6c). As suggested by the MoStGm orthography in the third column, [x] and [ç] in (6a-c) derived historically from WGmc $^{+}$[ɣ]. The same complementary distribution of [x] and [ç] holds for [sx sç] clusters (<WGmc $^{+}$[sk]) in (6d-f). Most significantly, the items listed in (6g) illustrate that palatal [ç] (<WGmc $^{+}$[ɣ]) occurs before schwa.

(6) [x] and [ç] in a word-initial onset in Elspe:

a.	xolt	[xɔlt]	Gold	'gold'	66
	xɑrvə	[xɑrvə]	Garbe	'sheaf'	24
	xɑ̄an	[xɑːɐn]	Garten	'garden'	25
b.	χīəz̧n	[çiːəʝn̩]	gegen	'against'	43
	χistan	[çɪstan]	gestern	'yesterday'	62
	χyt	[çʏt]	gießt	'waters-3sg'	97
	χɛəštə	[çɛːəʃstə]	Gerste	'barley'	38
	χelt	[çɛlt]	Geld	'money'	31
	χɒftə	[çæftə]	gäbe	'give-subj'	60
c.	χreŏt	[çrɛɔt]	groß	'large'	89
	χloftə	[çlɔftə]	glaubte	'believed-pret'	89
d.	šxugn	[ʃxʊɣn̩]	scheuen	'dread-inf'	96
	šxɑ̄p	[ʃxɑːp]	chrank	'cabinet'	23
e.	šχyt	[ʃçʏt]	schießt	'shoots-3sg'	97
	šχelə	[ʃçɛlə]	Schale	'bowl'	33
f.	šχrɑpn	[ʃçrɑpn̩]	schaben	'scrape-inf'	27
g.	χəvɑ̄a	[çəvɑːɐ]	gewahr	'aware'	25
	χəzelšop	[çəzɛlʃop]	Gesellschaft	'society'	68
	χəføalək	[çəføːɐlək]	gefährlich	'dangerous'	57

/x/ in a word-initial onset surfaces as [ç] before a coronal sonorant (in 6b,c,e,f) by (7), otherwise /x/ is realized as [x] (in 6a,d).

(7) Wd-Initial Velar Fronting-6:

$$_{\mathrm{wd}}[\ (\mathrm{C})\ \begin{bmatrix}-\textsc{son}\\+\textsc{cont}\end{bmatrix}\qquad [+\textsc{son}]$$

$$[\textsc{dorsal}]\qquad [\textsc{coronal}]$$

Word-initial [ç] (in 6g) is a quasi-phoneme /ç/ because it does not contrast with the corresponding velar in the context before schwa and because it derived historically from the palatal allophone [ç] of the velar /x/. The change from the original /i/ to /ə/ in the initial syllable was due to Vowel Reduction (=4c), e.g. [çəvɑːɐ] 'aware' < +[xivɑːɐ]; cf. OSax *giwar*. The latter change led to the overapplication of the historical precursor of (7).

Since Wd-Initial Velar Fronting-6 produces a sound ([ç]) that is present in underlying representations as a quasi-phoneme, that process is neither an allophonic rule, nor is it a neutralization. Instead, Wd-Initial Velar Fronting-6 is a quasi-neutralization in dialects like Elspe.

In the Eph dialect of Reinhausen (Jungandreas 1926, 1927; Footnote 4.3), [x ç] (<WGmc +[ɣ]) stand in complementary distribution in word-initial position. In his discussion of word-initial [x ç] Jungandreas observes that the velar [x] surfaces before back vowels ('vor velaren Vokalen') and the palatal [ç] before front vowels ('vor palatalen Vokalen'); see (8a,b). The author also notes that the palatal occurs before the two liquids, as in (8c,d). Significantly, the symbol ⟦r⟧ in the original source represents a uvular (=dorsal) sound ["Wgerm. *r* ist als Zäpfchen-r erhalten"; Jungandreas 1926: 288]. Jungandreas was aware of the anomalous nature of the palatal in (8d) in noting that its occurrence before [ʀ] is an indication that the rhotic was once pronounced as coronal [" ... ein Zeichen übrigens, dass *r* früher mit der Vorderzunge artikuliert wurde".]

(8) Word-initial dorsal fricatives in Reinhausen:

a.	xūl	[xuːl]	Gaul	'horse'	291
	xǫt	[xɔt]	Gott	'God'	291
b.	χęlt	[çɛlt]	Geld	'money'	291
	χēm	[çeːm]	geben	'give-INF'	291
c.	χlīk	[çliːk]	gleich	'same'	291
d.	χrunt	[çʀunt]	Grund	'reason'	291

Palatal [ç] derives from /x/ in (8b) by Wd-Initial Velar Fronting-6, but the opaque [ç] in (8d) is a quasi-phoneme (/ç/) because it does not contrast with [x] in the context before [ʀ] and because it derived historically from the allophone [ç] of /x/. Note that the quasi-phonemicization of /ç/ was a consequence of the change from the coronal rhotic /r/ to /ʀ/ by r-Retraction (in 4b). The palatal quasi-phoneme /ç/ before the dorsal rhotic [ʀ] (/ʀ/) in [çʀunt] 'reason' in example (8d) can be compared with the synchronically derived palatal [ç] (from /x/) before the coronal rhotic [r] (/r/) in example (6c) [çrɛɔt] 'large' from Elspe.

Böger (1906) describes the Wph variety of the region in and around the town of Schieder-Schwalenberg (Footnote 4.2). In word-initial position [x] (=⟦ɧ⟧) occurs before a back vowel (in 9a) or the dorsal (uvular) consonant [ʀ] (in 9b) and [ç] (=⟦χ⟧) before a front vowel (in 9c), coronal sonorant consonant (in 9d), or schwa (in 9e). The diachronic source for [x] and [ç] in the aforementioned examples is WGmc ⁺[ɣ]. In postsonorant position, velar [x] surfaces after a back vowel (in 10a) and palatal [ç] after a front vowel (in 10b). Both [x] and [ç] in (10a,b) derive from WGmc ⁺[x]. Velar [ɣ] (=⟦g⟧) surfaces in a word-internal onset after any vowel or sonorant consonant (in 10c) or as [ç] in coda position after a coronal sonorant consonant (in 10d). [ç] also surfaces in coda position after dorsal [ʀ] =⟦r⟧ (in 10e).

(9) Word-initial dorsal fricatives in Schieder-Schwalenberg:

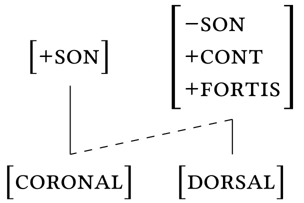
a.	ɧafəl	[xɑfəl]	Gabel	‘fork’	151
	ɧōən	[xoːən]	gehen	‘go-INF’	151
b.	ɧraf	[xʀɑf]	Grab	‘grave’	151
	ɧröte	[xʀøtə]	Größe	‘size’	152
c.	χistərn	[çistəʀn]	gestern	‘yesterday’	151
	χelt	[çelt]	Geld	‘money’	150
d.	χlas	[çlɑs]	Glas	‘glass’	151
	χnaidiχ	[çnɑidiç]	gnädig	‘merciful’	151
e.	χədult	[çədult]	Geduld	‘patience’	150
	χəfōr	[çəfoːʀ]	Gefahr	‘danger’	150

(10) Postsonorant dorsal fricatives in Schieder-Schwalenberg:

a.	luɧt	[luxt]	Licht	‘light’	157
	naɧt	[nɑxt]	Nacht	‘night’	158
b.	liχt	[liçt]	leicht	‘light’	156
	lüχtən	[lyçtən]	leuchten	‘glow-INF’	157
c.	jiugənt	[ɟiuɣənt]	Jugend	‘youth’	153
	mögən	[møɣən]	mögen	‘like-INF’	158
	ärgərn	[ɛʀɣərn]	ärgern	‘annoy-INF’	145
d.	talχ	[tɑlç]	Talg	‘tallow’	165
e.	ɑrχ	[ɑʀç]	arg	‘bad’	144
	ōərχ	[oːəʀç]	artig	‘well-behaved’	159

Word-initial /x/ surfaces as [ç] before a coronal sonorant by Wd-Initial Velar Fronting-6 (in 9c,d), otherwise /x/ is realized as [x] (in 9a,b). As in Elspe (in 6g), word-initial opaque [ç] before schwa (in 9e) is a quasi-phoneme (/ç/) which arose when the original front vowel /i/ was restructured to /ə/ by Vowel Reduction (=4c). After a coronal sonorant (in 10b,d), palatals derive from the corresponding velars (/x ɣ/) by Velar Fronting-4 (in 11), otherwise those velars surface without change as velar (in 10a,c).

(11) Velar Fronting-4:



The palatal quasi-phoneme /ʝ/ occurs after /ʀ/, surfacing as [ç] in coda position (in 10e). That quasi-phoneme arose historically when coronal /r/ was realized as uvular /ʀ/ by r-Retraction (=4b).

In Table 7.1 I provide historical derivations for representative examples for word-initial [x ç] from Reinhausen (in Table 7.1a) and Schieder-Schwalenberg (in Table 7.1b). To save space I do not include examples in which the original velar occurred before a back vowel.

Table 7.1: Historical derivations for word-initial [x ç] from Reinhausen and Schieder-Schwalenberg

(a) Reinhausen (=8)				(b) Schieder-Schwalenberg (=9)			
/xɛlt/	/xliːk/	/xrunt/		/xelt/	/xlɑs/	/xrɑf/	/xidult/
[xɛlt]	[xliːk]	[xrunt]	Stage 1	[xelt]	[xlɑs]	[xrɑf]	[xidult]
/xɛlt/	/xliːk/	/xrunt/		/xelt/	/xlɑs/	/xrɑf/	/xidult/
[çɛlt]	[çliːk]	[çrunt]	Stage 2	[çelt]	[çlɑs]	[çrɑf]	[çidult]
/xɛlt/	/xliːk/	/çʀunt/		/xelt/	/xlɑs/	/xʀɑf/	/çədult/
[çɛlt]	[çliːk]	[çʀunt]	Stage 3	[çelt]	[çlɑs]	[xʀɑf]	[çədult]
Geld	*gleich*	*Grund*	MoStGm	*Geld*	*Glas*	*Grab*	*Geduld*
‘money’	‘same’	‘reason’		‘money’	‘glass’	‘grave’	‘patience’

Consider first (Table 7.1a). At Stage 2 the two fricatives [x] and [ç] stood in an allophonic relationship, but when /r/ was restructured to /ʀ/ at Stage 3 in [çʀunt] ‘reason’ by r-Retraction the word-initial opaque fricative [ç] was quasi-phonemicized to /ç/. Examples like [çɛlt] ‘money’ and [çliːk] ‘same’ demonstrate that Wd-Initial Velar Fronting-6 remains active synchronically at Stage 3. In (Table 7.1b) [x ç] were allophones at Stage 2. In words like [xʀɑf] 'grave' r-Retraction restructured /r/ to /ʀ/ at Stage 3, but the original /x/ was not quasi-phonemicized (in contrast to the /x/ in Reinhausen [çʀunt] 'reason' in Table 7.1a). Instead, underlying /x/ in [xʀɑf] was retained as /x/ at Stage 3. The final example in (Table 7.1b) illustrates the quasi-phonemicization of /ç/ when Vowel Reduction restructured /i/ to /ə/ at Stage 3.

The Wph variety of Kreis Lippe (Hoffmann 1887; Footnote 4.2) has the four dorsal fricatives [x ɣ ç ʝ], whose postsonorant distribution is exemplified below. See §13.2.2 for discussion of word-initial position, where only palatals but not velars surface. In postsonorant position [x] (<WGmc $^+$[x] or $^+$[f]) surfaces after a back vowel (in 12a) and [ç] (<WGmc $^+$[x]) after a front vowel (in 12b). Velar [ɣ] surfaces in a word-internal onset after a back vowel (in 12c) and palatal [ʝ] in a word-internal onset after a front vowel (in 12d) or coronal sonorant consonant (in 12e). [ɣ ʝ] in those examples derive historically from WGmc $^+$[ɣ] or $^+$[gg]. Regular alternations involving the four dorsal fricatives permeate the inflectional system (in 12f). The example [dreːux] 'carried-PRET' in (12f) shows that the second part of the diphthong and not the first determines the place of the following dorsal fricative. Opaque palatals (quasi-phonemes) surface after dorsal [ʀ] (in 12g) and the diphthong [æu] (in 12h).[2] No example was found in the original source for [ç] after [æu], a gap I consider to be accidental.

(12) Postsonorant dorsal fricatives in Kreis Lippe:

a.	luxt	[lʊxt]	Luft	'air'	19
	dɑxt	[dɑxt]	Docht	'wick'	44
b.	liχt	[lɪçt]	leicht	'light'	44
	füχtə	[fʏçtə]	Fichte	'spruce'	46
	reχt	[ʀɛçt]	Recht	'justice'	15
c.	bǭʒə	[boːɣən]	Bogen	'bow'	19
	wɑʒən	[vaːɣən]	Wagen	'car'	50
	auʒə	[ɑuɣə]	Auge	'eye'	26
d.	χījən	[çiːʝən]	gegen	'against'	15
	brüjə	[brʏʝə]	Brücke	'bridge'	4
e.	χɑljən	[çɑlʝən]	Galgen	'gallows'	14

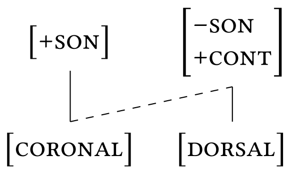
[2]It is clear from Hoffmann (1887: 5) that the one rhotic surfaces as a uvular consonant (/ʀ/) even in coda position; hence, r-Vocalization (§4.3) is not active in the dialect. As the phonetic symbol ⟦æu⟧ in the original source suggests, the first element in that diphthong is front and the second one back (in Hoffmann's terms "Guttural"; see Hoffmann 1887: 11–13).

f.	drẹ̄ux	[dreːux]	trug	‘carried-PRET’	24
	drẹ̄jən	[dreːɟən]	tragen	‘carry-INF’	4
	ʿɑux	[hɑux]	hoch	‘high’	25
	ʿoijər	[hoiɟər]	höher	‘higher’	26
g.	forχt	[fɔʀçt]	Furcht	‘fear’	18
	sorjə	[sɔʀɟə]	Sorge	‘sorrow’	18
h.	æujən	[æuɟən]	eigen	‘own’	23
	læujən	[læuɟən]	lägen	‘lie-SUBJ’	32
	læujən	[læuɟən]	lügen	‘lie-INF’	28

Hoffmann lists no examples in which a velar fricative surfaces after [æu]. It will become clear below that there is a historical reason for that gap. Significantly, [æu] has a relatively free distribution and is therefore phonemic (/æu/) in the dialect as it was described in 1886. For example, there are no restrictions concerning the place or manner of articulation of any consonants to the left or right of [æu], e.g. [bʀæuf] ‘letter’, [væuk] ‘soft’, [æutə] ‘eat-SUBJ’ What is more, [æu] contrasts with other diphthongs and monophthongs, e.g. in the context before [p] in [dæup] ‘deep’ vs. [knɑup] ‘button’.

The velars /x ɣ/ surface as palatal [ç ɟ] after a coronal sonorant (in 12b,d-f) by Velar Fronting-1 (in 13), otherwise those underlying velars are realized as [x ɣ] (in 12a,c,f).

(13) Velar Fronting-1:



[ç ɟ] are quasi-phonemes (/ç ɟ/) in (12g,h), e.g. /fɔʀçt/ ‘fear’, /æuɟən/ ‘own’. Those underlying (opaque) palatals arose historically from front ([coronal]) sounds to their immediate left. The historical /r/ in (12g) restructured to the [dorsal] rhotic (/ʀ/) via r-Retraction (=4b). The diphthong [æu] in (12h) was a front vowel at an earlier stage which shifted to [æu] (/æu/) by Vowel Retraction (=4a). In particular, [æu] is the reflex of earlier [eː] (/eː/), which itself derived form one of three vowels: [eː], [ɑː], [io] (all present in OSax, e.g. [æuɟən] ‘own’ (cf. OSax *ēgan*), [læuɟə] ‘lie-SUBJ’ (cf. OSax *lāgīn*), and [læuɟən] ‘lie-INF’ (cf. OSax *liogan*). The three original vowels [eː ɑː io] merged to the front vowel [eː] (/eː/), which later shifted to [æu]; Hoffmann (1887: 62–63). That all instances of modern [æu] were once a front monophthong ([eː] /eː/) derives additional support from the survey of LGm dialects presented in Sarauw (1921), who provides a list of the modern reflexes of the OSax vowels in question in eighteen LGm communities (p. 145). According to that chart, the modern reflexes are either front monophthongs (typically [eː]) or diphthongs whose second member is a front vowel (e.g. [ɑi], [ei]) in every LGm variety with the exception of the one described by Hoffmann (1887). What this suggests is that [æu] was at one point a front vowel and that the change to [æu] was a very recent shift because it only occurred in the Kreis Lippe variety and nowhere else.

7.3 Central German

Hasenclever (1905) describes the Rpn dialect of Wermelskirchen (Footnote 5.1). See §13.2.2 for discussion of word-initial position, where only palatals but not velars surface. In postsonorant position [x ɣ] (=⟦χ g⟧) surface after a back vowel (in 14a,c) and [ç ʝ] after a front vowel or coronal sonorant consonant (in 14b,d,e). Opaque palatals (quasi-phonemes) surface after the dorsal (uvular) rhotic (in 14f) or schwa (in 14g). Hasenclever (1905: 10) states that the sound he transcribes as ⟦r⟧ is uvular (=dorsal) and not coronal. The dorsal fricatives in (14) derived historically from velars (WGmc $^{+}$[ɣ x k]).

(14) Dorsal fricatives in Wermelskirchen:

a.	lɑχən	[lɑxən]	lachen	'laugh-INF'	51
b.	diçtə	[diçtə]	dicht	'dense'	51
	ʃpreçən	[ʃpreçən]	sprechen	'speak-INF'	51
c.	fūgəl	[fuːɣəl]	Vogel	'bird'	47
	zɑgən	[zɑɣən]	sagen	'say-INF'	47
d.	fɛjən	[fɛːʝən]	fegen	'sweep-INF'	47
e.	foljən	[fɔlʝən]	folgen	'follow-INF'	47
f.	ɛrjər	[ɛʀʝər]	Ärger	'anger'	47
g.	īːvəç	[iːvəç]	ewig	'eternal'	83

Wermelskirchen /x ɣ/ shift to the corresponding palatals after a coronal sonorant by Velar Fronting-1. The two contexts in which quasi-phonemes occur are: (i) after /ʀ/ (in 14f), and (ii) after /ə/ (in 14g). The original palatal allophones were quasi-phonemicized in (i) when /r/ was restructured to /ʀ/ by r-Retraction (in 4b), and in (ii) when front vowels shifted to schwa (/ə/) by Vowel Reduction (in 4c).

The vowel in the *-ig* ([əç]) suffix in (14g) derived historically from [i] (cf. OHG *-ig*).

In the MFr variety of Echternach (Palgen 1931; Footnote 5.3) velar [x] surfaces after back vowels (in 15a) and palatal [ç] after front vowels (in 15b). In intervocalic position historical [ɣ ʝ] (<WGmc $^{+}$[ɣ]) elided, although a few rare words preserve [ɣ] if the preceding vowel is back (in 15c). Palatal [ʝ] is regularly retained after a coronal sonorant consonant (i.e. [l] in 15d). Significantly, the two palatals [ç ʝ] also surface after the vocalized-r (in 15e,f). Palgen (1931: 6) observes that the one rhotic (/ʀ/) is articulated on the uvula ('Zäpfchen-r') in initial position and that it is vocalized in coda position. That sound is transcribed in the original source as ⟦ɒ⟧, which I render as [ɐ], as in all other German dialects with that sound (recall Chapter 2 and Chapter 3).

(15) Dorsal fricatives in Echternach:

a.	vox	[vox]	Woche	'week'	45
	hǫux	[hɔux]	Hauch	'breath'	27
b.	rīχtən	[ʀiːçtən]	richten	'judge-INF'	18
	brēχən	[bʀeːçən]	brechen	'break-INF'	45
	šläχt	[ʃlæçt]	schlecht	'bad'	21
c.	mōɣən	[moːɣən]	Magen	'stomach'	49
d.	gɑljən	[gɑlʝən]	Galgen	'gallows'	49
e.	kīɒχ	[kiːɐç]	Kirche	'church'	18
f.	z·ō.ɒχ	[zoːɐç]	Sorge	'sorrow'	49
	zōɒjən	[zoːɐʝən]	sorgen	'care for-INF'	49

Palatals ([ç ʝ]) in (15b,d) derive from velars (/x ɣ/) by Velar Fronting-1, otherwise they surface as [x ɣ] (in 15a,c). The palatals [ç] and [ʝ] in (15e,f) are quasi-phonemes (/ç ʝ/) which arose via r-Retraction (in 4b). Thus, the original rhotic was coronal [r] (/r/), which was restructured to [ʀ] (/ʀ/). From the synchronic perspective, /ʀ/ in the dialect as it was described in 1931 surfaces as [ɐ] in coda position by r-Vocalization:

(16) r-Vocalization:

$$\begin{bmatrix} +\text{CONS} \\ +\text{SON} \\ -\text{NASAL} \\ \text{DORSAL} \end{bmatrix} \rightarrow [-\text{CONS}] \;/\; \_\_\_\_ \; C_0 \;]_\sigma$$

Recall from §3.5 and §4.3 that Liquid Vocalization (and the more specific process of r-Vocalization) produce the back vowel [ɐ] in other dialects, e.g. Soest (Wph), Ramsau am Dachstein (CBav). A significant difference between those earlier case studies and Echternach is that dorsal fricatives to the right of the vocalized-r are realized as palatal and not as velar in Echternach, cf. [ʃtɔɐx] 'sorrow' (from /ʃtɔʀx/) in Ramsau am Dachstein and [bɛːɐx] 'mountain' (from /bɛːʀx/) in Soest. The occurrence of a palatal fricative after the vocalized-r in Echternach has a parallel in MoStGm, which is discussed in greater detail in §17.3.1.

The distribution of [x ç] (< WGmc ⁺[k x]) in the NHes variety attested in Loshausen (Corell 1936; Footnote 7.1) is illustrated in (17).

The velar surfaces after a back vowel (in 17a) and the palatal after a front vowel (in 17b) or a coronal sonorant consonant (in 17c). The item listed in (17d) shows that the opaque palatal [ç] surfaces after a noncoronal consonant. Loshausen also possesses the palatal fricative [ʝ], whose distribution is not discussed here.

(17) Dorsal fricatives in Loshausen:

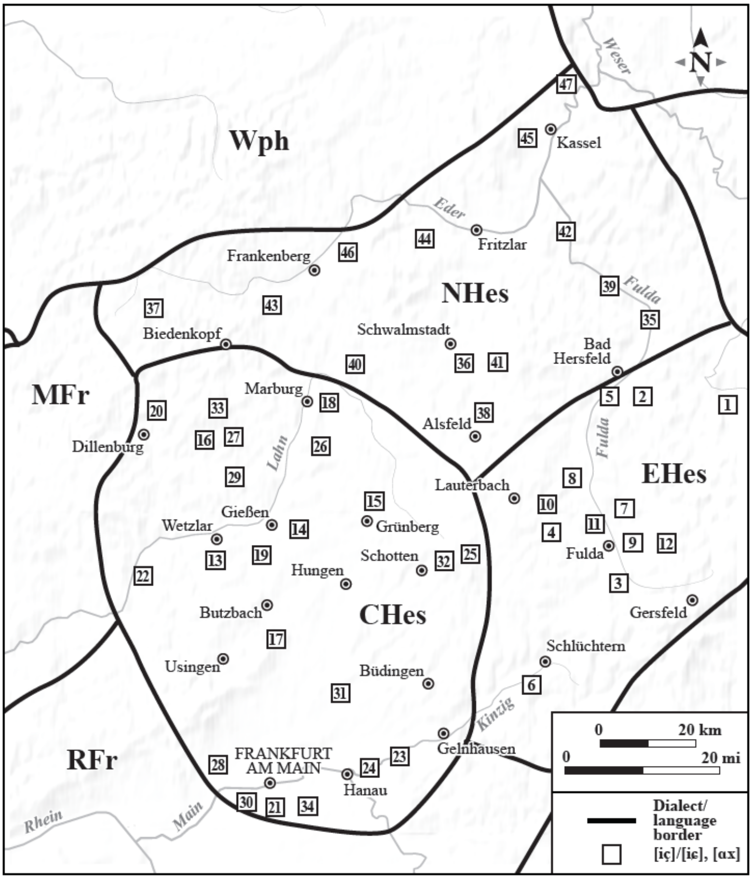
a.	ọ̄xt	[oːxt]	acht	'eight'	141
	lɑxə	[lɑxə]	lachen	'laugh-INF'	141
b.	ẹ̄χəl	[eːçəl]	Eichel	'acorn'	134
	ręχt	[rɛːçt]	recht	'right'	134
c.	mẹlχ	[melç]	Milch	'milk'	134
	lęrχ	[lɛrç]	Lerche	'lark'	134
d.	họbχ	[hɔpç]	Habicht	'hawk'	134

Palatal [ç] in (17b,c) is derived from /x/ by Velar Fronting-1, and the opaque [ç] in (17d) is a quasi-phoneme (/ç/) which arose when the original front vowel before [ç] was eliminated via Syncope (=4d).

Hofmann (1926) is a historical grammar and dictionary documenting the NHes community of Oberellenbach (Footnote 7.1). The examples in (18a-e) show the basic pattern whereby the palatals [ç ʝ] surface after a coronal sonorant and the velars [x ɣ] after a back vowel. In these examples, [x ç] are the reflexes of WGmc ⁺[k x] and [ɣ ʝ] of WGmc ⁺[ɣ]. The examples in (18f,g) exemplify the occurrence of the quasi-phoneme /ç/, which occurs after a noncoronal consonant in (18f) and word-initially before schwa (in 18g).

(18) Dorsal fricatives in Oberellenbach:

a.	būx	[buːx]	Buch	'book'	73
	kọx	[kɔx]	Koch	'cook'	145
	lɑxən	[lɑxən]	lachen	'laugh-INF'	153



Map 7.1: East Hessian (EHes), Central Hessian (CHes), and North Hessian (NHes). Squares indicate postsonorant velar fronting. 1=Hertel (1888), 2=Salzmann (1888), 3=Glöckner (1913), 4=Noack (1938), 5=Martin (1957), 6=Müller (1958a), 7=Weber (1959), 8=Krafft (1969), 9=Wegera (1977), 10=Post (1985), 11=Schwarz (1992), 12=Dingeldein (1995), 13=Leidolf (1891), 14=Wagner & Horn (1900), 15=Knauss (1906), 16=Schaefer (1907), 17=Reuss (1907), 18=Freund (1910), 19=Faber (1912), 20=Kroh (1915), 21=Rauh (1921), 22=Schwing (1921), 23=Siemon (1922), 24=Urff (1926), 25=Schudt (1927), 26=Bender (1938), 27=Friebertshäuser (1961), 28=Schnellbacher (1963), 29=Spenter (1964), 30=Bethge & Bonnin (1969), 31=Schudt (1970), 32=Hasselbach (1971), 33=Hasselberg (1979), 34=Féry (2017), 35=Dittmar (1891), 36=Schoof (1913a), Schoof (1913b), Schoof (1913c), 37=Hackler (1914), 38=Heidt (1922), 39=Hofmann (1926), 40=Bromm (1936), 41=Corell (1936), 42=Hofmann (1940), 43=Martin (1942) (Battenberg), 44=Martin (1942) (Bad Wildungen), 45=Müller (1958b), 46=Möhn (1962), 47=Arend (1991).

b.	eχ	[eç]	ich	'I'	129
	lø̄χ	[løːç]	Lauch	'leek'	19
	blɑ̜χ	[blæç]	Blech	'tin'	68
c.	wōʒə	[βoːɣə]	Waage	'scale'	27
d.	ijəl	[iʝəl]	Igel	'hedgehog'	27
	bējən	[beːʝən]	biegen	'bend-INF'	27
	sɑ̜jn̩	[sæːʝn̩]	sagen	'say-INF'	27
e.	mȩlχ	[mɛlç]	Milch	'milk'	168
	ɑ̜rjər	[ærʝər]	Ärger	'anger'	54
f.	hǫbχ	[hɔpç]	Habicht	'hawk'	24
g.	jəsønt	[ʝəsønt]	gesund	'healthy'	106

The opaque palatal in (18f) originally stood before a front vowel and was quasi-phonemicized when that segment underwent Syncope (=4d). The schwa in (18g) likewise derived historically from the front vowel [i] (/i/); the palatal that stood before that sound was quasi-phonemicized when the original /i/ underwent Vowel Reduction to [ə] (/ə/) (=4c). Note that word-initial WGmc ⁺[ɣ] shifted to [ʝ] only before [i], which was later realized as schwa; before any other sound, WGmc ⁺[ɣ] surfaces as [g], e.g. [geːʝən] 'around' (=⟦gējən⟧). The palatals in (18b,d,e) are derived from the corresponding velars by Velar Fronting-1, while the opaque sounds in (18f,g) are palatal quasi-phonemes (/ç ʝ/).

The NHes variety attested in and around Rauschenberg (Bromm 1936; Footnote 7.1) possesses the four dorsal fricatives [x ç ɣ ʝ]. The postsonorant distribution of the velar and palatal articulations is exemplified in (19): [x] surfaces after back vowels with the exception of the long low vowel [ɑː] (in 19a) and [ç] after front vowels (in 19b). Historical [ɑː] (/ɑː/) was regularly replaced with [ɔ] (/ɔ/), e.g. [ʃtɔxə] 'stung' (cf. MHG [stɑːx]). Velar [ɣ] likewise occurs after any phonemic vowel with the exception of [ɑː] (in 19c), while its palatal counterpart surfaces in a word-internal onset after a front vowel (in 19d) or coronal sonorant consonant (in 19e). The items listed in (19f) show that an opaque palatal [ç] surfaces after [ɑː] (/ɑː/). As indicated in the MoStGm orthography in the third column, the [ɑː] (/ɑː/) in the latter examples derived historically from the front vowel [e] (/e/). Parallel examples with opaque [ʝ] were not found in the original source.

(19) Dorsal fricatives in Rauschenberg:

a.	bux	[bux]	Buch	'book'	23
	hōx	[hoːx]	hoch	'high'	20
	nǫxd	[nɔːxt]	Nacht	'night'	9

	lǫx	[lɔx]	Loch	'hole'	23
	mɑxə	[mɑxə]	machen	'do-INF'	23
b.	liχd	[liçt]	Licht	'light'	20
	gəseχd	[gəseçt]	Gesicht	'face'	30
	dsę̄χə	[tsɛːçə]	Zeichen	'sign'	18
	bręχə	[brɛçə]	brechen	'break-INF'	23
	ręiχ	[rɛiç]	reich	'rich'	23
c.	foɣəl	[foɣəl]	Vogel	'bird'	25
	ǫɣə	[ɔːɣə]	Auge	'eye'	19
d.	flijə	[fliʝə]	fliegen	'fly-INF'	21
	wējə	[veːʝə]	Wege	'paths'	25
	fę̄jə	[fɛːʝə]	fegen	'sweep-INF'	25
e.	foljə	[folʝə]	folgen	'follow-INF'	25
f.	rɑχd	[rɑːçt]	recht	'right'	11
	šlɑχd	[ʃlɑːçt]	schlecht	'bad'	11
	gnɑχd	[knɑːçt]	Knecht	'vassal'	11

/x ɣ/ surface as the corresponding palatals after a front vowel (in 19b,d) or coronal sonorant consonant (in 19e) by Velar Fronting-1, otherwise (i.e. after a back vowel), they are realized as [x ɣ] (in 19a,c). The palatal fricative [ç] is a quasi-phoneme (/ç/) after the one back vowel [ɑː] (/ɑː/) in (19f). As noted above, that opaque palatal (quasi-phoneme) arose when the etymological front vowel preceding it ([e] /e/) restructured to [ɑː] (/ɑː/) by Vowel Retraction (=4a).

In the EHes variety documented in the communities of the Rhön Valley (Rhöntal; Glöckner 1913; Footnote 7.1) the two dorsal fricatives [x ç] exhibit a pattern of distribution represented by the data in (20): [x] surfaces after a back vowel (in 20a) and [ç] after a front vowel (in 20b) or coronal sonorant consonant (in 20c). It is clear from the original source that ⟦a⟧ and ⟦aa⟧ represent low front vowels (=[æ æː]) and that ⟦ɑ⟧ and ⟦ɑɑ⟧ are low back vowels (=[ɑ ɑː]). The most significant examples are the ones in (20d,e), which reveal that palatal [ç] surfaces after the long low back vowel [ɑː]. [x] or [ç] surface optionally after [ɑː] derived historically from [e] (in 20d), but only [ç] occurs after the [ɑː] deriving from earlier [ei] (in 20e). The optionality in (20d) is speaker-dependent.[3]

[3] Glöckner gathered his data from speakers in a variety of communities living in a broad region; hence, the speaker-dependent variation referred to here is probably a factor of geography. [ɣ] does not occur in the dialect as it was described in 1913; historical +[ɣ] (/ɣ/) restructured to /x/, which regularly underwent fronting in words like [rɛːçl̩] 'rule' and otherwise surfaces as [x] in items like [foːxl̩] 'bird'. A small number of items in the original source contain palatal [ʝ] in

(20) Dorsal fricatives in the Rhöntal:

a.	gərūx	[gəruːx]	Geruch	'smell'	31
	brux	[brux]	brauchen	'need-INF'	43
	fōxl̥	[foːxl̩]	Vogel	'bird'	28
	bǫx	[bɔːx]	Buch	'book'	92
	kǫx	[kɔx]	kochen	'cook-INF'	29
	sɑx	[sɑx]	Sache	'thing'	91
	boux	[boux]	Bauch	'stomach'	44
b.	iχ	[iç]	ich	'I'	92
	wīχ	[βiːç]	Wiege	'cradle'	24
	füχd	[fyçt]	Feuchte	'humidity'	46
	rẹ̄χl̥	[rɛːçl̩]	Regel	'rule'	21
	lēχd	[lɛçt]	Licht	'light'	51
	swöχ	[sβøç]	Schwäche	'weakness'	18
	fraχ	[fræç]	frech	'impudent'	92
	šlaaχd	[ʃlæːçt]	schlecht	'bad'	21
c.	gwaarχ	[kβæːrç]	quer	'across'	21
d.	blɑɑχ, blɑɑx	[blɑːç], [blɑːx]	Blech	'tin'	22
	bɑɑχ, bɑɑx	[bɑːç], [bɑːx]	Pech	'misfortune'	22
e.	wɑɑχ	[βɑːç]	weich	'soft'	58

I account for the optionality in (20d) as follows: I postulate two groups of speakers (Variety A and Variety B). For speakers of Variety A [x] occurs after all back vowels with the exception of [ɑː] (=20a), and [ç] surfaces after coronal sonorant consonants (=20b,c) or after [ɑː] (=20e and the [ç] realization in 20d). Speakers of Variety B have [x] after all back vowels, including [ɑː] (=20a and the [x] realization in 20d) and [ç] after coronal sonorant consonants (=20b,c) or [ɑː] (=20e). For Variety B the two fricatives [ç] and [x] contrast after [ɑː]. I do not discuss that type of example because similar case studies are dealt with at length in Chapter 8 (for word-initial position) and in Chapter 9 (for postsonorant position).

For Variety A the two fricatives [x] and [ç] do not contrast. As in Rauschenberg (recall 19f) there is a historical reason for the nonoccurrence of [ç] after [ɑː]: First, etymological [ɑː] (/ɑː/) was replaced by [ɔː] (/ɔː/); e.g. [nɔːx] 'after' (cf. MHG *nāch*), or [ɔ] (/ɔ/); [dɔxt] 'wick' (cf. MHG *tāht*). Second, the vowel [ɑː] (/ɑː/) in the dialect

a word-internal onset after a front vowel, but I do not take these examples into consideration below.

as it was described in 1913 derived historically from a front vowel, namely [e] (/e/) in (20d) and [ei] (/ei/) in (20e).

Palatal [ç] after a front vowel (in 20b) or coronal sonorant consonant (in 20c) derives synchronically from /x/ by Velar Fronting-1 and otherwise surfaces as [x] (in 20a). The opaque palatal fricative [ç] is a quasi-phoneme (/ç/) for those Variety A speakers who have that sound after the back vowel [ɑː] in (20d) and for the examples with [ç] in (20e). As noted above, the quasi-phoneme /ç/ arose when the etymological front vowel preceding it (/e/ or /ei/) restructured to [ɑː] (/ɑː/) by Vowel Retraction (=4a).[4]

In the Thrn dialect of Sondershausen (Schirmer 1932; Footnote 7.2) the two dorsal fricatives [x] and [ç] never contrast. As illustrated in (21a,b), the velar occurs after a back vowel and the palatal after a front vowel. [ɣ ʝ] do not occur in postsonorant position because the historical source for those sounds (WGmc ⁺[ɣ]) was restructured to /x/, which is realized as [x] after a back vowel, e.g. [duːçənt] 'virtue' (=⟦dūxənt⟧) and [ç] after a coronal sonorant, e.g. [iːçəl] 'hedgehog' (=⟦īχəl⟧). Two contexts for quasi-phonemes are (i) after a noncoronal consonant (in 21c) or (ii) in word-initial position before schwa (in 21d).

(21) Dorsal fricatives in Sondershausen:

a.	būx	[buːx]	Buch	'book'	65
	lox	[lox]	Loch	'hole'	65
	då̄x	[dɑx]	Dach	'roof'	65
b.	rīχ	[ʀiːç]	reich	'rich'	65
	bręχə	[bʀɛçə]	brechen	'break-INF'	65
	blæχ	[blæç]	Blech	'tin'	65
c.	gǣfχ	[kæːfç]	Käfig	'cage'	14
d.	χəsiχtə	[çəsiçtə]	Gesicht	'face'	18

The item in (21c) exemplifies the deletion of an etymological front vowel (Syncope in 4d) and in (21d) Vowel Reduction (in 4c). The historical source for word-

[4] Glöckner (1913) also includes a number of examples in which palatal [ç] (=⟦χ⟧) surfaces after the diphthong [ɔə] (=⟦ǫə⟧, e.g. ⟦ǫəχd⟧ 'eight'). Since the diphthong in question consists of two back vowels there is an apparent conundrum because the etymological vowel ([ɑ]) was back, e.g. ⟦ǫəχd⟧ (cf. MHG *aht*). I hold that the original vowel [ɑ] (/ɑ/) underwent a restructuring to a diphthong ending in a front vowel (e.g. [ɔi]/[ɔɪ]), at which point the /x/ following that vowel surfaced as a palatal allophone by Velar Fronting-1. When the front vowel in that diphthong was restructured to one ending in schwa ([ɔə] /ɔə/), the following palatal was quasi-phonemicized. Evidence for the intermediate stage whereby [ɑ] (/ɑ/) changed to a diphthong ending in a front vowel is attested in the CHes variety spoken in Weidenhausen (Friebertshäuser 1961; Footnote 7.1) discussed in §9.3.

initial [ç] in (21d) is WGmc +[ɣ]. In word-initial position before any sound other than schwa, that etymological fricative is realized as [g], e.g. [gift] 'poison'.

7.4 Discussion

I consider and reject three alternative treatments for the case studies given in this chapter, all of which have in common that they eschew quasi-phonemes and treat the rules relating velars and palatals as allophonic operations and not as quasi-neutralizations (§7.4.1–§7.4.3). Those alternative treatments qualify as straw man analyses, although it needs to be stressed that formally similar treatments have been applied to independent sets of examples in German as well as other languages. I conclude this section (§7.4.4) by considering and rejecting Kiparsky's (2015) claim that quasi-phonemes arise before the original conditioning factor was eliminated.

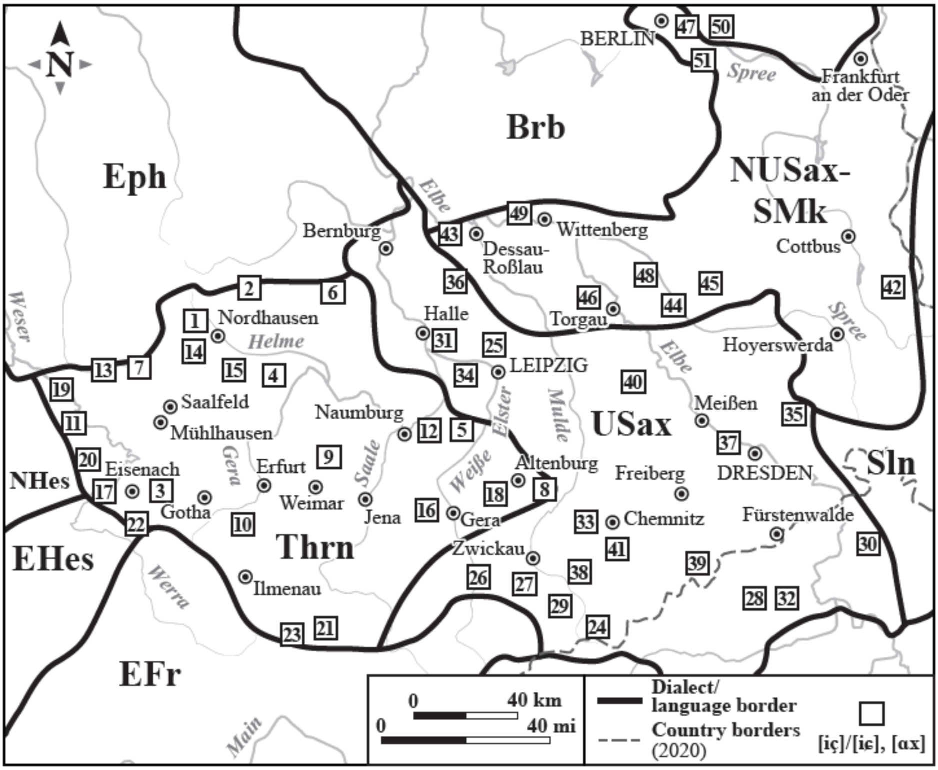
Recall that the case studies discussed above all have in common that the palatal quasi-phoneme is adjacent to a noncoronal segment, namely before or after the dorsal rhotic (/ʀ/), after a full back vowel (e.g. /æu/, /ɑ/), or before or after schwa (/ə/). I refer below to the noncoronal segments adjacent to quasi-phonemes as NCSs.

7.4.1 Analysis A: Counterbleeding opacity

According to this alternative treatment NCSs are phonologically [coronal]. That [coronal] feature then spreads from a NCS to the adjacent velar fricative (/x/ or /ɣ/) by some version of velar fronting, and a later operation deletes [coronal] from the NCS. The treatment described here can potentially be applied to any of the NCSs referred to above. As a representative example, I consider the diphthong /æu/ of Kreis Lippe (from 12h). In the treatment depicted in (22a), [æu] is analyzed as a diphthong ending in a [coronal] sound in the underlying representation (/æi/), which shifts to [æu] by a rule I refer to as /i/-Retraction (/æi/⟶[æu]). Kreis Lippe does not possess the surface diphthong [æi].

(22) Alternative treatment for Kreis Lippe (rejected):

	a.		b.	
		/æiɣən/		/æiɣən/
	Vel Fr-1	æiʝən	/i/-Retraction	/æuɣən/
	/i/-Retraction	æuʝən	Vel Fr-1	—
		[æuʝən]		*[æuɣən]
		'own'		



Map 7.2: Thuringian (Thrn), Upper Saxon (USax), and North Upper Saxon-South Markish (NUSax-SMk). Squares indicate post-sonorant velar fronting. 1=Schultze (1874), 2=Liesenberg (1890), 3=Flex (1893), 4=Frank (1898), 5=Trebs (1899), 6=Hennemann (1901), 7=Hentrich (1905), 8=Daube (1906), 9=Kürsten & Bremer (1910), 10=Kürsten (1910, 1911), 11=Rasch (1912), 12=Hankel (1913), 13=Hentrich (1920), 14=Rudolph (1924/1925), 15=Schirmer (1932), 16=Dietrich (1957), 17=Spangenberg (1962), 18=Spangenberg (1974, 1989), 19=Guentherodt (1982) (Dudenrode), 20=Guentherodt (1982) (Netra), 21=Harnisch (1987), 22=Weldner (1991), 23=Spangenberg (1998), 24=Goepfert (1878), 25=Albrecht (1983 [1881]), 26=Hertel (1887), 27=Philipp (1897), 28=Hausenblas (1898), 29=Lang (1906), 30=Pompé (1907), 31=Bremer (1909), 32=Hausenblas (1914), 33=Große (1955), 34=Große (1957), 35=Protze (1957), 36=Schönfeld (1958), 37=Fleischer (1961), 38=Bergmann (1965), 39=Becker (1969), 40=Bethge & Bonnin (1969), 41=Kahn & Weise (2013), 42=Goessgen (1902), 43=Bischoff (1935), 44=Kieser (1963), 45=Seibicke (1967), 46=Krug (1969), 47=Bethge & Bonnin (1969), 48=Stellmacher (1973), 49=Langner (1977), 50=Schönfeld (1986), 51=Schönfeld (2001).

Observe that the correct output in (22a) can only be obtained if /i/-Retraction counterbleeds Velar Fronting-1 (Vel Fr-1) in the synchronic phonology. The relationship is counterbleeding because the reverse ordering in (22b) requires /i/-Retraction to bleed Velar Fronting-1. Note too that the counterbleeding ordering involves overapplication of Velar Fronting-1 because the front vowel trigger for [ç] in the phonetic representation is not present on the surface.

Although no study to my knowledge has proposed the specific treatment in (22a) to the Kreis Lippe data, many phonologists endorse similar analyses for phenomena in other languages. Examples in early generative phonology are easy to come by, e.g. Chomsky & Halle (1968) and many other authors writing during the 1970s. More recently, Calabrese (2005) proposes a derivational model with counterbleeding orderings involving overapplication. For example, in his treatment of Icelandic, Calabrese (2005: 38–41) follows Anderson (1981) in deriving palatal stops from underlying velars in the context before front vowels (Palatalization). For example, /k/ surfaces as [c] in [cɪftɑ] 'marry-INF' (from /kɪftɑ/) but as [k] in [kouːmyr] 'palate' (from /kouːmyr/). In order to account for the occurrence of palatal stops before the diphthong [ɑiː], Calabrese analyzes that diphthong as a low front monophthong. Given that treatment, [c] is derived from /k/ before that low front monophthong because Palatalization is ordered before the change from a low front monophthong to [ɑiː] (Low Vowel Diphthongization). For example, the /ɑ/ in /kɑl-i/ 'freeze-SUBJ 1 SG' shifts to the low front vowel |æ| by Umlaut, which feeds Palatalization, at which point Low Vowel Diphthongization applies, i.e. /kɑl-i/⟶|kæl-i|⟶|cæl-i|⟶|cɑil-i|, which is ultimately realized as [cʰɑiːli]. The important point is that Low Vowel Diphthongization counterbleeds Palatalization.

Recall from §5.4 that there is no evidence in the present survey on German dialects that any version of velar fronting is counterbled synchronically by another rule. A significant finding of Chapter 5 is that opacity involving the fronting of velars in German dialects involves synchronic counterfeeding orders but not synchronic counterbleeding orders. That point aside, I also question the wisdom behind rules like /i/-Retraction in (22a), which exemplify ABSOLUTE NEUTRALIZATIONS (see Kaisse & Shaw 1985 and other authors in the Lexical Phonology and Morphology framework). What the treatment in (22a) amounts to is Velar Fronting-1 overapplying because it is counterbled by a rule of absolute neutralization whose sole purpose is to undo a representation that never surfaces. The advantage of the present treatment is that it does not require counterbleeding opacity involving rules eliminating fictional segments, as in (22a).

7.4.2 Analysis B: NCCs are permanently [coronal]

The objections to counterbleeding opacity could potentially be mitigated by adopting a treatment in which the NCS in question is underlyingly [coronal] and remains [coronal] throughout the phonological component. I apply Analysis B to the NCS /ʀ/ because that type of treatment has been made in the published literature discussed below. The arguments I level against analyzing /ʀ/ in that way can be extended to a treatment of other NCSs as well.

Two representations for /ʀ/ according to Analysis B are presented in (23). Both of those structures have in common that the surface dorsal sound [ʀ] is analyzed as phonologically [coronal] in the underlying representation. (23a) is a singleton coronal segment, while (23b) is a complex corono-dorsal sound.

(23) Alternative representations for /ʀ/ (rejected):

a. Singleton coronal:

$$\begin{bmatrix} \text{+CONS} \\ \text{+SON} \\ \text{−NASAL} \end{bmatrix}$$
$$|$$
$$[\text{CORONAL}]$$

b. Complex corono-dorsal:

$$\begin{bmatrix} \text{+CONS} \\ \text{+SON} \\ \text{−NASAL} \end{bmatrix}$$
$$\diagup \quad \diagdown$$
$$[\text{CORONAL}] \quad [\text{DORSAL}]$$

Given either representation in (23) the surface palatal [ç] in the context of /ʀ/ can be analyzed as velar /x/ and not as the quasi-phoneme /ç/. For example, the word [çʀunt] 'reason' from Reinhausen in (8d), which I analyze as underlyingly /çʀunt/, can be reanalyzed according to Analysis B as /xʀunt/. The /x/ in that type of example surfaces as [ç] by Wd-Initial Velar Fronting-6 because the liquid is [coronal], as in (23).

Representations similar to the ones in (23) have been posited for surface dorsal liquids in both the cross-linguistic literature and in the literature on German phonology. For example, Blevins (1994) examines the phonological patterning of the velar (dorsal) lateral /ʟ/ in several Trans-New Guinean languages spoken in Papua New Guinea. She shows that [ʟ] alternates with simplex (alveolar) coronals such as [t] and [l] in languages such as Yagaria, Kuman and Kanite. Within Gmc, Hall (2009a) presents material from the SBav variety spoken in Imst (Schatz 1897; Footnote 3.3), in which the dorsal rhotic [ʀ] patterns phonologically with the alveolar coronal stop [d]. Both Blevins and Hall argue that the phonetically dorsal liquids in question are phonologically [coronal], as in (23a).

The structure in (23b) is akin to the universal representation for liquids proposed by Walsh Dickey (1997). Glover (2014) argues that MoStGm /ʀ/ is underlyingly underspecified for place features and that default rules create the complex corono-dorsal structure in (23b).

Although it might seem appealing to adopt a treatment whereby palatals are created from /x/ in the context of /ʀ/, the disadvantages both representations in (23) have is that they do not derive independent support. The argument for the treatment of /ʀ/ as [coronal] in MoStGm is based solely on the occurrence of the surface palatal fricative [ç] after that sound. Significantly, there is no evidence that Reinhausen /ʀ/ is coronal if /ʀ/ is situated in any context other than word-initial position after [ç]. Citing the analysis of Hall (1995), Glover (2014) argues that phonotactic evidence from MoStGm corroborates an analysis of /ʀ/ as [coronal]. However, the phonotactic evidence referred to here only holds for postvocalic consonant clusters where /ʀ/ occupies the first slot. No phonotactic evidence supports (23) for /ʀ/ in a context other than the first slot in a sequence of two postvocalic consonants, e.g. word-initial /ʀ/, /ʀ/ between vowels etc. A more serious drawback with that type of argumentation is that same phonotactics involving postvocalic consonant clusters hold in dialects like Schieder-Schwalenberg, where /ʀ/ demonstratively patterns as a noncomplex (singleton) [dorsal] fricative (recall 9b).

An advocate of either (23a) or (23b) might claim that the quasi-phonemes in my analysis do not have independent support either, but this contention is not correct. Quasi-phonemes are surface palatals that must be analyzed as underlying palatals because they do not appear in a context where they can be derived by any version of velar fronting. The highly specific contexts for quasi-phonemes (e.g. word-initial position before /ʀ/ in Reinhausen in 8d) derive diachronic support: The reason quasi-phonemes appear synchronically only when adjacent to certain NCSs like /ʀ/ is that those NCSs were once phonologically [coronal] at an earlier historical stage. That feature was then transferred to the dorsal fricative and created the new quasi-phoneme when the original [coronal] trigger lost the feature [coronal] by sound change (=4). But the same point cannot be made for the representations in (23) because the feature [coronal] in those two structures is present regardless of whether or not those representations are adjacent to a dorsal fricative.

7.4.3 Analysis C: Underlying palatals but no underlying velars

A final alternative to palatal quasi-phonemes is to maintain that all instances of surface velars and surface palatals derive from underlying palatals. Analysis C is illustrated in (24) with six representative words from Elspe from (6) and the alternative rule in (25).

(24) Alternative analysis for Elspe (rejected):

a. /çɔlt/ ⟶ [xɔlt] 'gold'
b. /çɪstan/ ⟶ [çɪstan] 'yesterday'
c. /çrɛɔt / ⟶ [çrɛɔt] 'large'
d. /ʃçɑːp/ ⟶ [ʃxɑːp] 'cabinet'
e. /ʃçɛlə/ ⟶ [ʃçɛlə] 'bowl'
f. /çəvɑːɐ/ ⟶ [çəvɑːɐ] 'aware'

(25) Wd-Initial Palatal Retraction (rejected):
/ç/ ⟶ [x] / $_{\text{wd}}$[(C) ____ back vowel

Since the sound triggering Wd-Initial Palatal Retraction is phonologically back (i.e. [dorsal]), the underlying palatal /ç/ in (24a,d) undergoes it and correctly surfaces as [x]. /ç/ in the neighborhood of schwa in (24f) fails to undergo Wd-Initial Palatal Retraction given the representation of schwa that is placeless and therefore correctly surfaces as [ç]. Finally, /ç/ before front sounds (in 24b,c,e) surface without change as [ç]

Although the alternative treatment for Elspe in (24) and (25) works technically, I reject it because it cannot be extended successfully to other German dialects with quasi-phonemes. As a representative example, consider the reanalysis in (26) and (27) of the realization of [ɣ ʝ] in Kreis Lippe (from 12). Note that there is an underlying palatal /ʝ/, but no /ɣ/.

(26) Alternative analysis for Kreis Lippe (rejected):

a. /ɑuʝə/ ⟶ [ɑuɣə] 'eye'
b. /spɪʝən/ ⟶ [spɪʝən] 'spout-INF'
c. /sɔʀʝə/ ⟶ [sɔʀʝə] 'sorrow'
d. /æuʝən/ ⟶ [æuʝən] 'own'

(27) Palatal Retraction (rejected):
/ʝ/ ⟶ [ɣ] / back vowel____

The rule of Palatal Retraction in (27) correctly produces [ɣ] in example (26a), but that same process cannot account for the palatal after [ʝ] in (26d).

[ç] and [ʝ] in the examples discussed in the present chapter – regardless of variety – are uncontroversially the product of historical rules that fronted etymological velars. Seen in this light, the proposed diachronic treatment whereby underlying palatals (quasi-phonemes) emerge in the neighborhood of back sounds that were once front is not controversial. Analysis C is an attempt to eschew opacity

(=palatal quasi-phonemes) by analyzing all instances of dorsal fricatives as underlying palatal in a synchronic treatment. Since velar fronting (and not palatal retraction) was uncontroversially the correct historical process for all German dialects, Analysis C presupposes that rule inversion (Vennemann 1972, McCarthy 1991, Blevins 2004, Hall 2009b) has taken place in every variety of German with quasi-phonemes. Although a rule of Palatal Retraction for word-initial position akin to the one in (25) is posited for an Eph variety in §8.5, it is the only one of its nature discovered in the present survey of velar fronting in German dialects.

Analysis C is directly related to one of the controversial research questions discussed in the literature on the distribution of dorsal fricatives in MoStGm (§1.2): Do the two sounds [x] and [ç] derive synchronically from /x/ or /ç/? Since that question can only be addressed after all case studies of German dialects have been presented, I delay discussion until §17.3.3. In that section I demonstrate that the evidence is overwhelming that palatals derive from velars and not the other way around. That conclusion cannot be reconciled with Analysis C.

7.4.4 Kiparsky's (2015) treatment of quasi-phonemes

Kiparsky (2015) offers an analysis of i-Umlaut in the history of German that relies crucially on the notion of vocalic quasi-phonemes. It is instructive to consider his analysis because his quasi-phonemes are argued to possess a property that cannot be extended to the palatal quasi-phonemes endorsed in this chapter.

Kiparsky's concern is how and why phonemes originate (phonemicization) and why they are sometimes lost (merger). In his treatment of the phonemicization of front rounded vowels in the history of German summarized below, Kiparsky makes crucial use of the notion of quasi-phoneme. In Kiparsky's system, quasi-phonemes are defined in terms of two binary parameters, which he dubs "contrastiveness" and "distinctiveness". Contrastiveness relates to whether or not the distribution of the sounds in question is contextually predictable; distinctiveness is a perceptual notion which refers to whether or not native speakers regard the sounds in question as phonetically different. The traditional definition of phonemes requires that the sounds in question to be both contrastive (contextually unpredictable) and distinctive (perceived as different), while traditional allophones are neither contrastive (because they are in complementary distribution) nor distinctive (because native speakers are typically unaware of the difference between allophones of a given phoneme).

The two properties referred to above predict the existence of two types of sounds that are unexpected in traditional phonemic theory. First, there may be sounds that are distinctive without being contrastive (quasi-phonemes) and second, there could be sounds that are contrastive without being distinctive (near contrasts). The four logical possibilities are summarized in Table 7.2.

Table 7.2: Distinctiveness and contrastivity (Kiparsky 2015)

	contrastive	noncontrastive
distinctive	phoneme	quasi-phoneme
nondistinctive	near contrast	allophone

According to Kiparsky, the change from allophones to phonemes depicted in (1) involves an intermediate stage, namely quasi-phonemes. His claim is illustrated in the following example from the history of German.

The historical rule of i-Umlaut (Chapters 3–4) fronted back vowels before [i] or [j] in the following syllable. At a later stage the two triggers were eliminated: [j] was lost, while [i] – like all other unstressed vowels – was restructured to schwa ([ə] /ə/) by Vowel Reduction. The examples in (28b,c) – adapted from Kiparsky (2015) – illustrate the effects of both i-Umlaut and Vowel Reduction. Example (28a) shows that the original back vowel (/uo/ [uo]) is retained without change when there is no suffix present.

(28)

	OHG			MHG		
a.	[huot]	(/huo/)	>	[huot]	(/huo/)	'hat'
b.	[huote]	(/huot-e/)	>	[huotə]	(/huot-ə/)	'hat.DAT.SG'
c.	[hyeti]	(/huot-i/)	>	[hyetə]	(/hyet-ə/)	'hats'

The most important example is (28c): That item illustrates that the trigger for i-Umlaut (/i/) was restructured to /ə/, at which point the conditioning environment for i-Umlaut was no longer present. In the traditional literature (e.g. Twaddell 1938) it is assumed that the loss of the conditioning environment for the earlier allophonic rule of i-Umlaut triggered the phonemicization of originally allophonic front vowels like [ye] (from /uo/) to phonemic front vowels (/ye/) in MHG. That change is depicted in (29). Note that [ye] and [uo] contrasted in the context before schwa in MHG.

(29) /huot-i/ /huot-e/
[huoti] [huote] pre-OHG

/huot-i/ /huot-e/
[hyeti] [huote] OHG

/hyet-ə/ /huot-ə/
[hyetə] [huotə] MHG
'hats' 'hat-DAT SG'

The question Kiparsky (2015) ponders (see also Liberman 1991) is why the underlying representation for OHG [ye] (/uo/) was not retained as /uo/ after the conditioning environment was eliminated, in which case the (nominative) plural MHG /huot-ə/ would have surfaced as *[huotə]. Since that type of change did not occur, Kiparsky proposes that the future front vowel phonemes (e.g. [ye]) were quasi-phonemicized – they became perceptually distinctive, as depicted in Table 7.2 – prior to the loss of the conditioning environment (Vowel Reduction); see also the discussion in Janda (2005: 409ff.). The approach envisioned by Kiparsky would therefore reanalyze the historical progression in (29) as in (30):

(30) /huot-i/ /huot-e/
[huoti] [huote] pre-OHG

/huot-i/ /huot-e/
[hyeti] [huote] ([ye] and [uo] are allophones)

/hyet-i/ /huot-e/
[hyeti] [huote] ([ye] /ye/ is a quasi-phoneme)

/hyet-ə/ /huot-ə/
[hyetə] [huotə] ([ye] /ye/ and [uo] /uo/ are phonemes)
'hats' 'hat-DAT SG'

Note that three of the categories from Table 7.2, namely allophones, quasi-phonemes, and phonemes, are related historically in the sense that allophones, become quasi-phonemes, which in turn become phonemes.

There are several differences between Kiparsky's quasi-phonemes and my own. Recall from §2.4.3 that I defined palatal quasi-phonemes as phonemic palatals which posses two properties: (a) they do not contrast with the corresponding velar, and (b) they have an opaque (counterbleeding) history. For example, in the data from Schieder-Schwalenberg in (6), word-initial [ç] in the context before schwa ([ə]) is an underlying palatal (/ç/) that does not contrast with [x] and which has an opaque history schematized in (3a). Although property (a) is the same in my treatment and in the one proposed by Kiparsky (recall 28), property (b) is not because Kiparsky's quasi-phonemes have a transparent history, as illustrated in (30). That same historical derivation illustrates that Kiparsky's quasi-phonemes occupy an intermediate stage between allophones and phonemes. However, as I point out below in §9.4.2, it is not always the case that phonemic palatals without palatal quasi-phonemes.[5]

The most significant difference between Kiparsky's quasi-phonemes and my own is that palatal quasi-phonemes in my analysis must emerge *after* the conditioning environment for velar fronting is lost and not before. The reason Kiparsky's treatment cannot be extended to my palatal quasi-phonemes that those palatals can indeed revert back to their original velars in other dialects. More than one example illustrating reversion were given earlier. For example, as shown in Table 7.1, the loss of the conditioning environment for velar fronting caused the original velar /x/ to become quasi-phonemicized to /ç/ before /ʀ/ (< /r/) in Reinhausen, but the palatal allophone [ç] (/x/) in Schieder-Schwalenberg reverted back to [x] /x/ in the same context. The same point can be illustrated by comparing the distribution of word-initial [x] and [ç] in two Wph dialects discussed earlier, namely Soest (§4.3) and Elspe (§7.1). Three representative words from those two dialects are given for Soest (in 31) and Elspe (in 32). The three categories represent the three contexts "before a full back vowel", "before schwa", and "before a front vowel".

(31)	a. [xuət]	/xuət/	gut	'good'
	b. [xədʊlt]	/xədʊlt/	Geduld	'patience'
	c. [çɪstɐn]	/xɪstɐn/	gestern	'yesterday'
(32)	a. [xɔlt]	/xɔlt/	Gold	'gold'
	b. [çəvɑːɐ]	/çəvɑːɐ/	gewahr	'aware'
	c. [çɪstan]	/xɪstan/	gestern	'yesterday'

The difference between the two dialects is the context before schwa, which was originally a front vowel (/i/). Compare now three historical stages for Soest (in 33a) and Elspe (in 33b):

[5] The property of being distinct as defined above (recall 7.2) does not play a role in the present treatment of quasi-phonemes; in fact, I do not discuss this issue in any chapter of this book because it is not addressed in the original sources I cite.

(33) a.

			b.			
/xɪstɐn/	/xidʊlt/		/xɪstan/	/xivɑːɐ/		
[xɪstɐn]	[xidʊlt]		[xɪstan]	[xivɑːɐ]	Stage 1
/xɪstɐn/	/xidʊlt/		/xɪstan/	/xivɑːɐ/	
[çɪstɐn]	[çidʊlt]		[çɪstan]	[çivɑːɐ]	Stage 2
/xɪstɐn/	/xədʊlt/		/xɪstan/	/çəvɑːɐ/	
[çɪstɐn]	[xədʊlt]		[çɪstan]	[çəvɑːɐ]	Stage 3
'yesterday'	'patience'		'yesterday'	'aware'	

At Stage 2 Vowel Reduction had not yet reduced full vowels to schwa. Velar fronting was phonologized and therefore created the palatal [ç] before any front vowel. At Stage 3 Vowel Reduction restructured unstressed vowels like /i/ to schwa (/ə/). Significantly, the elimination of the conditioning environment – the creation of /ə/ – led to the emergence of the palatal quasi-phoneme /ç/ in Elspe, but not in Soest, where the original underlying sound (/x/) is retained.[6]

An issue relating to (33) is how those historical changes can be interpreted given a historical model whereby change is intergenerational and listener-driven (§2.5).

Consider first (33a), where transparent Stage 2 remains transparent at Stage 3: The speaker (P_1) utters [çidʊlt] (from /xidʊlt/), but the listener (P_2) misperceives the first vowel as schwa ([ə]). (S)he therefore alters the pronunciation by replacing [i] with [ə]. P_2 correctly perceives the first segment in [çidʊlt] as a palatal, but (s)he also knows that [ç] does not occur before full back vowels. None of the words P_2 has acquired begin with a palatal fricative before schwa. (S)he assumes that there is an exceptionless ban on words beginning with [ç] followed by any back vowel – full back vowels and schwa – and therefore substitutes the palatal fricative with the other dorsal fricative allophone [x]. Hence, the earlier pronunciation ([çidʊlt]) undergoes two modifications ([xədʊlt]), but only one of those modifications is the result of misperception. Equally important is that P_2 alters the underlying representation to one retaining the earlier /x/, while adopting the new vowel schwa, i.e. /xədʊlt/.

Consider now (33b), where transparent Stage 2 becomes opaque Stage 3: The speaker (P_1) utters [çivɑːɐ] 'aware' (from /xivɑːɐ/), but the listener (P_2) misper-

[6]Kiparsky's quasi-phonemes have been viewed critically in some of the recent literature (Renwick & Ladd 2016). Those authors correctly point out that the notion of contrast is much more nuanced than what Kiparsky's four-way classification in Table 7.2 suggests. In particular, they demonstrate that the mid vowels of Italian illustrate marginal contrasts that cannot be easily categorized in Kiparsky's terms. I do not discuss Renwick & Ladd (2016) because it is not clear that their criticisms of Kiparsky's system in Table 7.2 can be extended to the quasi-phonemes in my own analysis.

ceives the first vowel as schwa and therefore alters the pronunciation by replacing [i] with [ə]. P_2 also correctly perceives the palatal fricative as palatal; hence, [ç] is retained. On the basis of other words P_2 has acquired (s)he knows that [ç] does not occur word-initially before full back vowels, but the word-initial back vowels in all of the words acquired do not include schwa. P_2 therefore concludes that the fricative [ç] in word-initial position before schwa is phonotactically legal because [çə] does not contrast with [xə]. The word is therefore pronounced as [çəvɑːɐ], but more significantly, P_2 posits a new underlying representation, namely /çəvɑːɐ/.

7.5 Areal distribution of palatal quasi-phonemes

The survey of German dialects in this chapter reveals that underlying palatals (quasi-phonemes) are well-attested in LGm and CGm. The case studies presented in Chapters 8–10 indicate that palatal quasi-phonemes also occur in varieties of German not mentioned in the present chapter, e.g. EPo and LPr (both ELGm) as well as USax and HPr (both ECGm). Table 7.3 lists the varieties of German with palatal quasi-phonemes discussed in §7.2 and §7.3 as well as a few additional ones I have found in the sources provided. The places listed below that have not been discussed are depicted on Footnote 5.2, Footnote 5.3, and Footnote 11.2. All of the places in the first column of Table 7.3 are plotted on Footnote 7.3.

I make no claim that the list of places in Table 7.3 is anywhere near being complete. Thus, a closer scrutiny of the sources listed in Appendix B should reveal many additional varieties that could be added to Table 7.3 and included on a future revision of Footnote 7.3.[7]

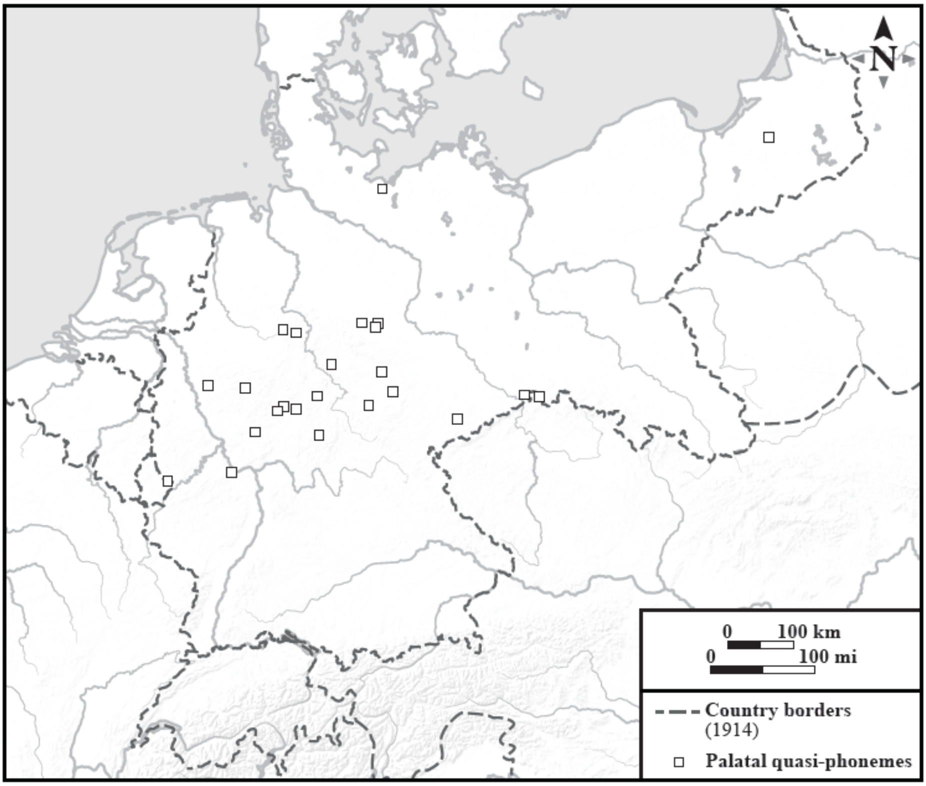
It is not difficult to find examples of underlying palatals (quasi-phonemes) like the ones discussed above in linguistic atlases. I conclude this section by considering the occurrence of underlying palatals due to Syncope (in 4d) and due to changes eliminating the frontness feature of an original /r/. I focus on two specific linguistic atlases illustrating the occurrence of sounds such as /ç/ in those two contexts.

According to ThürDA, there is an area in Thuringia possessing coda clusters with [ç], which arose via Syncope in (4d); recall the word [kæːfç] ‘cage’

[7] One way of finding additional examples is to conduct an in-depth investigation of the regions affected by the sound changes listed in (4). However, it needs to be stressed that the set of German dialects with palatal quasi-phonemes is not identical to the set of German dialects with the sound changes deleting the frontness feature discussed in this chapter. The reason is that those changes do not automatically result in the emergence of an underlying palatal because they can revert back to the original velar, as demonstrated in Table 7.1, (31), and (32).

Table 7.3: Varieties of LGm (upper box) and CGm (lower box) with palatal quasi-phonemes (< WGmc ⁺[k x ɣ]) in word-initial and/or post-sonorant position.

Place	Dialect	Source
Kreis Lippe	Wph	Hoffmann (1887)
Schieder-Schwalenberg	Wph	Böger (1906)
Elspe	Wph	Arens (1908)
Eilsdorf	Eph	Block (1910)
Reinhausen	Eph	Jungandreas (1926, 1927)
Dorste	Eph	Dahlberg (1934, 1937)
Dingelstedt am Huy	Eph	Hille (1939)
West Mecklenburg	MeWPo	Kolz (1914)
Wermelskirchen	Rpn	Hasenclever (1905)
Warmsroth	MFr	Martin (1922)
Echternach	MFr	Palgen (1931)
Rhöntal	EHes	Glöckner (1913)
Selters bei Weilburg	CHes	Schwing (1921)
Marburg	CHes	Spenter (1964)
Oberellenbach	NHes	Hofmann (1926)
Loshausen	NHes	Corell (1936)
Rauschenberg	NHes	Bromm (1936)
Seifhennersdorf	Sln	Michel (1891)
Sebnitz	Sln	Meiche (1898)
Bad Frankenhausen	Thrn	Frank (1898)
Buttelstedt	Thrn	Kürsten & Bremer (1910)
Southeast Thuringia	Thrn	Kürsten (1910, 1911)
Vorerzgebirge	USax	Bergmann (1965)
Reimerswalde	HPr	Kuck & Wiesinger (1965)



Map 7.3: Areal distribution of palatal quasi-phonemes. High German and Low German varieties with palatal quasi-phonemes (< WGmc ⁺[k x ɣ]) in word-initial or post-sonorant position are indicated with white squares.

(cf. MoStGm [kɛːfɪç]) in Sondershausen (Thrn) from (21c), as well as the similar items from CHes in (17d) and (18c). According to Map 26 in ThürDA (for the word *Friedhof* 'cemetery') there are parts of central and west Thuringia where that word is realized as *kirfich* or *kerwich*, but to the south the word undergoes two modifications: First, the second vowel is syncopated, and second, the final two consonants metathesize, i.e. *kirfich* > *kirfch* > *kirchf*. The commentary for Map 26 (Volume 2: 136) makes it clear that the consonant cluster is [ʀfç] after Syncope and [ʀçf] after Metathesis. The same commentary notes the similarity between those clusters and clusters of obstruent plus [ç] in words, such as *teigig* 'doughy' (⟦dēgχ⟧=[deːgç]) and *Teppich* 'carpet' (⟦dębχ⟧=[dɛbç]). The important point is that the palatal fricative [ç] in all of the examples mentioned must be an underlying palatal (/ç/) because it is not preceded by a coronal sonorant.

Underlying palatals in the context of an original /r/ are documented in MRhSA for the MFr/RFr dialect area. Since /r/ is one of the segments serving as a trigger for velar fronting any change that eliminates its frontness feature can induce the restructuring of an adjacent velar (/x/) to palatal (/ç/). Underlying palatals are documented on Map 224 in Volume 3 of MRhSA for *durch* 'through'. In (34) I list four places on that map with the respective phonetic representations. The reason I have chosen those particular places is that these are the ones listed in that source with [ç] after a back vowel.

(34) Palatal ([ç]) after an etymological /r/:
   a. Barweiler [d̥uç]
   b. Wendelsheim [d̥ɔəç]
   c. Kuhardt [d̥ɔəç]
   d. Ilbesheim [d̥oəç]

The data listed above indicate that /x/ has been restructured to /ç/ because the original /r/ was either deleted (in 34a) or converted into a diphthong consisting of back vowels (in 34b-d). It is not possible to say whether or not the /ç/ in (34) is a quasi-phoneme or a phonemic palatal (Chapter 9), but either way it is an underlying palatal and not a palatal synchronically derived from /x/.[8]

The data from ThürDA and MRhSA should give the reader a feeling for the pervasiveness of palatal quasi-phonemes. Syncope is a change that is well-attested throughout CGm, and changes eliminating the frontness feature of an earlier /r/ are well-documented in HGm and LGm. For these reasons it should not be difficult to find additional attestations of underlying palatals like the ones discussed in this chapter.

7.6 Conclusion

The case studies discussed in this chapter have in common that they possess opaque palatals (quasi-phonemes), which by definition are underlying palatals that cannot be derived synchronically from other sounds. From the historical

[8] A skeptic might attempt to argue that the schwa in (34b-d) is phonetically (and phonologically) front, in which case [ç] as opposed to [x] would be the expected outcome of velar fronting. I reject any treatment along those lines because there is no independent evidence in any German dialect for a front ([coronal]) schwa. It is possible that the schwa in (34b-d) is phonetically not as retracted as the schwa before other sounds, but this is a consequence of coarticulation (phonetics). See §17.3.1 for my rejection of an analysis of the vocalized-r in MoStGm as a front sound.

perspective, palatal quasi-phonemes were once palatal allophones of underlying velars that were restructured to underlying segments when historical processes eliminated the front vowels that originally served as triggers for velar fronting. Palatals in the neighborhood of back sounds that were originally front exemplify the underapplication of the historical process of velar fronting.

In the following two chapters I consider German dialects with underlying palatals that differ from quasi-phonemes because they contrast with the corresponding velars. Those contrastive (i.e. phonemic) palatals can arise historically in more than one way, although it is demonstrated below that the four changes listed in (4) are instrumental in their development.

8 Phonemicization of palatals (part 1)

8.1 Introduction

This chapter investigates dialects in which velars and the corresponding palatals contrast in word-initial position. Those contrasting dorsal sounds are captured directly in the underlying representation with phonemic velars (e.g. /x/) and phonemic palatals (e.g. /ç/). As described below, there is more than one way in which palatals were phonemicized (recall §2.4.3, §2.5).

The following case studies are organized into three distinct types, defined both synchronically and diachronically. In certain varieties (Contrast Type A) the sounds in question contrast before back vowels and front vowels, but in others (Contrast Type B) that contrast occurs before back vowels but not before front vowels, where only the palatal surfaces. In yet another system (Contrast Type C) the velar and the palatal contrast before front vowels, but before back vowels only the velar surfaces. It is argued below that velars and palatals are all phonemic in Contrast Type A-C (either /ɣ ʝ/ or /x ç/). The distribution of word-initial velars and palatals for the three systems are depicted in (1), where [i] and [ɑ] are cover symbols for front vowels and back vowels respectively.

(1) a. Contrast Type A:

$_{\text{wd}}$[[ʝi…] $_{\text{wd}}$[[ʝɑ…]
$_{\text{wd}}$[[ɣi…] $_{\text{wd}}$[[ɣɑ…]

b. Contrast Type B:

$_{\text{wd}}$[[ʝi…] $_{\text{wd}}$[[ʝɑ…]
$_{\text{wd}}$[[ɣɑ…]

c. Contrast Type C:

$_{\text{wd}}$[[çi…]
$_{\text{wd}}$[[xi…] $_{\text{wd}}$[[xɑ…]

The three systems in (1) are not equally common among German dialects. There is no question that (1b) represents the default case, which is represented by many descriptions of LGm varieties spoken throughout northern Germany (including the pre-1945 regions in the east; see Chapter 11). (1a) is not nearly as well-attested as (1b), although it can be found in more than one variety in the neighborhood of the Dutch border. (1c) is restricted to a single Eph village. As such, it deserves special attention because it shows how a unique system can develop as the result of a dialect-specific change introducing potentially new front vowel triggers.

Word-initial palatal vs. velar contrasts as in (1) came about in more than one way, the first of which is exemplified in (2). In WGmc there was a contrast between the lenis velar fricative $^{+}$[ɣ] (/ɣ/) and the palatal glide $^{+}$[j] (/j/). That WGmc system is depicted to the left of the wedge in (2). At that stage $^{+}$[ɣ] occurred before front vowels, back vowels, or consonants and $^{+}$[j] before front vowels or back vowels but not before consonants (Appendix F). The original fricative vs. glide contrast was altered to a contrast between the lenis velar fricative [ɣ] (/ɣ/) and the lenis palatal fricative [ʝ] (/ʝ/) by Glide Hardening (§4.2, restated in 3). When that restructuring occurred, a contrast arose in word-initial position between a velar fricative /ɣ/ and the corresponding palatal fricative /ʝ/ (=1a).

(2) Phonemicization of /ʝ/ in word-initial position (Glide Hardening):

/ɣ/	/j/	>	/ɣ/	/ʝ/
|	|		|	|
[ɣ]	[j]		[ɣ]	[ʝ]

(3) Glide Hardening:
/j/ > /ʝ/ $_{\sigma}$[__

In the system depicted to the right of the wedge in (2), [ɣ] and [ʝ] contrast before a back vowel or front vowel (=1a). Word-initial velar fronting is absent in that system; what is more, there never was a stage in which that process was active in its history. Palatal [ʝ] before a back vowel and velar [ɣ] before a front vowel do not involve opacity because velar fronting was never active in word-initial position.

The way in which the velar vs. palatal contrast in (2) emerged is very different from the developments that led to Contrast Type B and Contrast Type C. As indicated in (4) those two systems arose by a phonemic split:

(4)

/Ve/	>	/Ve/		>	/Ve/	/Pa/
|		|	\\		|	|
[Ve]		[Ve]	[Pa]		[Ve]	[Pa]

Consider first Contrast Type B, which is depicted in (5a) and (5b). As indicated in the heading below, the change in both (5a) and (5b) involved the phonemic split of the two allophones [ɣ] and [ʝ], as in (4).

(5) Phonemic splits in word-initial position triggered by merger (Glide Hardening):

a.

/ɣ/	/j/	>	/ɣ/		/j/	>	/ɣ/	/ʝ/
[ɣ]	[j]		[ɣ]	[ʝ]	[j]		[ɣ]	[ʝ]

b.

/ɣ/	/j/	>	/ɣ/		/j/	>	/ɣ/	/ʝ/	>	/ɣ/	/ʝ/
[ɣ]	[j]		[ɣ]	[ʝ]	[j]		[ɣ]	[ʝ]		[g]	[ʝ]

In (5a), WGmc $^+$[ɣ] (/ɣ/) shifted to the corresponding palatal [ʝ] in the context before a coronal sonorant (or some subset thereof) via velar fronting (after the first wedge). Since that change occurred before WGmc $^+$[j] underwent Glide Hardening, velar fronting was still an allophonic rule relating the positional variants [ɣ] and [ʝ]; see Chapter 16 for discussion on the time frame for the changes in (5a). When Glide Hardening merged [j] (/j/) with the [ʝ] allophone of /ɣ/ (after the second wedge) a contrast between /ɣ/ and /ʝ/ emerged before a back vowel (as in 1b). That new palatal does not exemplify overapplication opacity because it was not the product of velar fronting.

It is shown below that velar fronting was not lost after the phonemicization of the palatal in (5a). Instead, velar fronting remained in that system as a rule of neutralization creating [ʝ] from /ɣ/ before a front vowel. The palatal in that type of example exemplifies the synchronically derived palatal discussed in §2.4.3.

A variant of (5a) is depicted in (5b). As in (5a), word-initial velar fronting was active as an allophonic rule at the stage before Glide Hardening transpired (after the first wedge). After Glide Hardening merged the new /ʝ/ with the earlier allophone [ʝ], [ɣ] (/ɣ/) was realized as [g] (after the third wedge). As in (5a), word-initial velar fronting remains active in (5b) as a rule of neutralization, thereby creating a derived palatal before a front vowel.

Changes other than a merger can trigger the phonemic split in (4). Consider (6), which shows Contrast Type C:

(6) Phonemic split in word-initial position (r-Deletion):

/ɣ/	>	/x/	>	/x/		>	/x/	/ç/
[ɣ]		[x]		[x]	[ç]		[x]	[ç]

WGmc $^+$[ɣ] (/ɣ/) underwent Word-Initial ɣ-Fortition (§4.3) to [x] (/x/), at which point the new [x] developed a palatal allophone before a front vowel by velar fronting (after the second wedge). In word-initial position before a consonant, WGmc $^+$[ɣ] was likewise realized as [x], but that fricative did not shift to palatal [ç] because the set of triggers for word-initial velar fronting consisted solely of front vowels. The crucial examples involve WGmc $^+$[ɣ] before [r], e.g. sequences like $^+$[ɣri] (where [i] represents any front vowel) and [ɣrɑ] (where [ɑ] represents any back vowel). In word-initial [xr] clusters, the rhotic was elided (by 7) regardless of the nature of the following vowel.

(7) r-Deletion:
/r/ > ∅ / $_{\mathrm{wd}}$[C ___

As a consequence of (7), sequences like [xri] (/xri/) and [xrɑ] (/xrɑ/) were restructured to [xi] (/xi/) and [xɑ] (/xɑ/) respectively. The result was that [x] and [ç] contrast in word-initial position before a front vowel, but before a back vowel only [x] surfaces (as in 1c). Note that the pre-front vowel [x] exemplifies the historical underapplication of velar fronting. As discussed at length below, r-Deletion led directly to rule inversion. This means that the historical rule fronting a word-initial /x/ to [ç] was reanalyzed as a synchronic rule converting a palatal (/ç/) to the corresponding velar ([x]) before a back vowel.

A phonemic split between a word-initial velar and palatal (as in 4) can also occur when the front vowel triggering the original palatal allophone undergoes a qualitative change to a back vowel by Vowel Retraction (§7.1). That development (attested in 1b dialects) is depicted schematically in (8). The number of words exemplifying the type of change here it is very small (§8.6.2). By contrast, the mirror-image phonemic split of velar and palatal in postvocalic position is well-attested in copious examples (Chapter 9). Recall that Vowel Retraction is also responsible for the emergence of quasi-phonemes (Chapter 7).

(8) Phonemic splits in word-initial position (Vowel Retraction):

a.	/ɣ/	/j/	>	/ɣ/		>	/ɣ/	/ʝ/
	[ɣ]	[j]		[ɣ]	[ʝ]		[ɣ]	[ʝ]

b. /ɣ/ /j/ > /x/ > /x/ /ç/

[ɣ] [j] [x] [ç] [x] [ç]

The original WGmc system in (8) led to one in which velar and palatal fricatives were allophones (after the second wedge). When one or more front vowel triggering the palatal allophones shifted to a back vowel by Vowel Retraction, the earlier palatal remained palatal before the new back vowel, thereby creating a contrast between velar and palatal (as in 1b). Note that the opaque pre-back vowel palatal exemplifies the historical overapplication of velar fronting.

§8.2 focuses on a case study (from LFr) with a word-initial [ɣ] vs. [ʝ] contrast before back vowels and front vowels (Contrast Type A). In §8.3 and §8.4 I examine Eph varieties (Contrast Type B), in which the word-initial velar vs. palatal contrast is attested before a back vowel. §8.5 investigates an Eph variety (Contrast Type C) in which [x] and [ç] contrast in word-initial position before a front vowel. §8.6 provides some discussion and §8.7 an assessment of the areal distribution of word-initial phonemic palatals. Concluding remarks can be found in §8.8.

8.2 Low Franconian

Two very similar varieties of LFr are described by Meynen (1911) for Homberg and Hanenberg (1915) for Kalkar. Both places are indicated on Footnote 5.1. I restrict my discussion below to the Kalkar variety, although the one for Homberg is essentially the same.

The phonemic front and back vowels for Kalkar are /i e ɛ ɛː æ y ø œ/ and /u o ɔ ɑ ə/ respectively, most of which can occur as either short or long. I interpret Hanenberg's ⟦ɛ⟧ as the low vowel [æ] because it occupies a place in his vowel chart lower than his ⟦ę⟧ (=my [ɛ]). Kalkar possesses the four dorsal fricatives [x ç ɣ ʝ], of which only [ɣ ʝ] occur initially. The distribution of those sounds is expressed in (9):

(9) /ɣ/ /ʝ/

[ɣ] [ʝ]

The significance of Kalkar is that the velar and corresponding palatal in (9) contrast in word-initial position before any kind of vowel (=1a).

The data in (10) exemplify the distribution of word-initial [ɣ] and [ʝ], both of which derived from WGmc ⁺[ɣ]. Hanenberg's symbol ⟦g⟧ represents a lenis (voiced) velar fricative ('stimmhafter, gutturaler Reibelaut') and his ⟦j⟧ a lenis (voiced) palatal fricative ('stimmhafter, palataler Reibelaut'). [ɣ] occurs word-initially before back vowels (in 10a), front vowels (in 10b), or consonants (in 10c). The [ɣ] in all of these examples is inherited without change from WGmc ⁺[ɣ]. The etymological palatal ([ʝ]) surfaces before back vowels (in 10d) or front vowels (in 10e). As in many other dialects, the etymological palatal is rare before a front vowel.

(10) Word-initial dorsal fricatives in Kalkar:

a.	gūt	[ɣuːt]	gut	'good'	216
	gǫlt	[ɣɔlt]	Gold	'gold'	216
	gədei̯ə	[ɣədeiə]	gedeihen	'thrive-INF'	217
b.	gø̨n	[ɣœn]	gehe	'go-1SG'	211
	gę̄rn	[ɣɛːrn]	gern	'gladly'	192
	gɛlt	[ɣælt]	Geld	'money'	192
c.	glik	[ɣlik]	gleich	'soon'	198
	grōnd	[ɣʀoːnt]	Grund	'reason'	195
d.	jǫmər	[ʝɔmər]	Jammer	'lament'	209
	jɑxt	[ʝɑxt]	Jagd	'hunt'	209
e.	jø̨kə	[ʝœkə]	jucken	'itch-INF'	209

Kalkar contrasts [ɣ] and [ʝ] before front and back vowels alike. In fact, it is not difficult to find examples in which the two fricatives occur before the same vowel, e.g. [ɣɔlt] 'gold' vs. [ʝɔmər] 'lament'. From the synchronic perspective both velar and palatal are phonemic, as depicted in (9).

As illustrated in (2), word-initial contrasts like the ones in (10) arose historically from an earlier stage in which the fricative [ɣ] (<WGmc ⁺[ɣ]) contrasted with the palatal glide [j] (<WGmc ⁺[j]). When the latter sound underwent Glide Hardening, the contrast between /ɣ/ and /ʝ/ emerged.

Phonemicization as in (2) is also attested in other varieties of German spoken in the same general region, two examples of which are presented in (11) and (12). The first three categories in both of those datasets exemplify the contexts for [ɣ] before back vowels, front vowels, and coronal consonants respectively. (11d) and (12d) are items with the etymological palatal ([ʝ]). Both sources cited below are clear that the respective word-initial sounds in (11) and (12) represent lenis velar and palatal fricatives. Like Kalkar, the two varieties below can be classified as Contrast Type A (=1a), although [ʝ] is unstable before a front vowel.

(11) Lathen (NLGm; Schönhoff 1908; Footnote 4.1):

a.	ʒ̥ou̯t	[ɣout]	gut	'good'	183
b.	ʒ̥œ̄vn	[ɣœːvn̩]	geben	'give-INF'	195
c.	ʒ̥lyk	[ɣlyk]	Glück	'fortune'	175
d.	jɔ̄	[ʝɔː]	ja	'yes'	155

(12) Montzen (Rpn; Welter 1933; Footnote 5.1):

a.	ɣɑ̄:də	[ɣɑːdə]	Garten	'garden'	18
b.	ɣę̄:.lt	[ɣɛːlt]	Geld	'money'	18
c.	ɣru·ə.t	[ɣruət]	groß	'large'	18
d.	jǭ:r	[ʝɔːr]	Jahr	'year'	23

One difference between Lathen and Montzen on the one hand and Kalkar/Homberg on the other is that only Kalkar/Homberg have velar fronting in post-sonorant position. By contrast, in both Lathen and Montzen the velars [x] and [ɣ] surface after front and back vowels. The pattern described here for Kalkar/Homberg is also attested in the Rpn variety of Ronsdorf (Holthaus 1887; Footnote 5.1), although velar fronting only affects the fortis fricative in postsonorant position.

8.3 Eastphalian (part 1)

Block (1910) describes the Eph dialect of Eilsdorf (Footnote 4.3). The phonemic front and back vowels are /iː ɪ eː e ɛː ɛ yː ʏ œː œ/ and /uː ʊ ɔ ɑː ɑ ə/ respectively.[1] The diphthongs ending in a front vowel are /oi ɑi/ and the ones ending in a back vowel are /ɑu oːə øːə eːə/. Eilsdorf has the four dorsal fricatives [x ç ɣ ʝ]. In contrast to the related Eph variety spoken in Dingelstedt am Huy (§8.4), Eilsdorf possesses no [g]. The only dorsal fricatives occurring word-initially are [ɣ ʝ], which contrast as in the varieties discussed in §8.2, e.g. Kalkar. The word-initial dorsal sounds have the distribution depicted in (9).[2]

The examples in (13) exemplify the occurrence of velar [ɣ] in word-initial position before a full back vowel (in 13a) or a coronal consonant (in 13b). The coronal (apical) rhotic ('Zungenspitzen-r') is realized consistently as [r], regardless

[1] I omit the vowel Block (1910: 327) describes as an overshort open i-sound ('überkurzer offener i-Laut'), which appears to be a variant pronunciation of [ə].

[2] In postsonorant position the four dorsal fricatives of Eilsdorf are [x ç ɣ ʝ]. The two palatals surface after coronal sonorants and the two velars after back vowels, as in Eph variety of Dorste (§4.4). In the context after schwa, [ʝ] is a palatal quasi-phoneme (/ʝ/), e.g. [brɛdəʝɑm] 'groom'(=⟦brędəjɑm⟧).

of whether or not it occurs in the onset or in the coda. The coronal consonant referred to here ([n l r]) can be followed by any type of vowel. Gaps involving the phonemic vowels listed above after word-initial [ɣ] are accidental. The word-initial sound in (13) derived from WGmc ⁺[ɣ].

(13) Word-initial [ɣ] (from /ɣ/):

a.	ʒuut	[ɣuːt]	gut	'good'	342
	ʒu̜ln	[ɣʊln]	Gulden	'Guilder'	349
	ʒo̜rts	[ɣɔrts]	Gottfried	'(name)'	342
	ʒɑt	[ɣɑt]	Loch	'hole'	342
	ʒɑ̊ɑ̊n	[ɣɑːn]	gehen	'go-INF'	342
	ʒɑit	[ɣɑit]	geht	'goes-3SG'	335
	ʒɑus	[ɣɑus]	Gans	'goose'	342
b.	ʒlɑs	[ɣlɑs]	Glas	'glass'	340
	ʒleezər	[ɣleːzər]	Gläser	'glasses'	333
	ʒriis	[ɣriːs]	Greis	'old man'	340
	ʒni̜tə	[ɣnɪtə]	kleine Mücke	'small mosquito'	342

The examples in (14) reveal that palatal [ʝ] surfaces in word-initial position before a back vowel. The orthography indicates that the [ʝ] in question (etymological palatal) is the modern reflex of the WGmc palatal glide ⁺[j].[3]

(14) Word-initial [ʝ] (from /ʝ/):

ju̜ŋk	[ʝʊŋk]	jung	'young'	338
jɑmər	[ʝɑmər]	Jammer	'lament'	338
jɑ̊ɑ̊	[ʝɑː]	ja	'yes'	338
jɑuln	[ʝɑuln̩]	jaulen	'yowl-INF'	338

From the synchronic perspective, Eilsdorf exemplifies (1b). Block does not list words beginning with the etymological palatal followed by a front vowel, although the [ʝ] deriving from WGmc ⁺[ɣ] in the context before a front vowel are present in some of the examples discussed below.

[3] [ʝ] (<WGmc ⁺[ɣ]) – but never [ɣ] – occurs in word-initial position before schwa, e.g. [ʝəzʊnt] 'healthy' (=⟦ʝəzu̜nt⟧). As in a number of case studies discussed in Chapter 7, the palatal in that type of example represents the palatal quasi-phoneme /ʝ/. The presence of [ʝ] before a back vowel does not imply that Eilsdorf represents (1a) because there is no contrast between [ʝ] and [ɣ] before schwa. One very general question concerning all dialects with a contrast between a velar and the corresponding palatal is whether or not the a palatal quasi-phoneme is always present in those systems. If so, this suggests that the quasi-phonemicization of palatals is a necessary prerequisite for the phonemicization of palatals. Since this question can only be addressed after all case studies involving phonemicization have been investigated I delay discussion until §9.4.2.

As indicated in (13a) and (14), [ɣ] and [ʝ] contrast in word-initial position before a full back vowel. Note that some of these items illustrate the contrast between [ʝ] and [ɣ] holds before the same vowels, e.g. [ɣʊln] 'Guilder' vs. [ʝʊŋk] 'young'. On the basis of contrasts like these, [ʝ] and [ɣ] are both phonemic (/ʝ/ and /ɣ/).

In word-initial position before a front vowel, [ʝ] (<WGmc ⁺[ɣ]) surfaces in many items (as in 15). The front vowels in examples like these were also etymological front vowels. From the synchronic perspective palatal [ʝ] in (15) does not alternate with [ɣ].

(15) Word-initial [ʝ] (from /ɣ/):

jiir	[ʝiːr]	Gier	'greed'	342
jįstərn	[ʝɪstərn]	gestern	'yesterday'	342
jüüstə	[ʝyːstə]	unfruchtbar	'barren'	342
jęlt	[ʝɛlt]	Geld	'money'	342
jeel	[ʝeːl]	gelb	'yellow'	342

As indicated above, I analyze the underlying representation for word-initial [ʝ] before a front vowel in (15) as velar (/ɣ/), which undergoes Wd-Initial-Velar Fronting-3 (§4.3), repeated in (16). Velar /ɣ/ (as opposed to palatal /ʝ/) is justified in (15) because [ɣ] and [ʝ] never contrast before a front vowel (as in 1b). The word-initial palatals in (15), together with the ones discussed in (17) below, exemplify derived palatals (§2.4.3). Wd-Initial Velar Fronting-3 applies as a neutralization in (15) because the contrast between [ɣ] and [ʝ] is suspended in favor of [ʝ] in word-initial position before a front vowel. The neutralization property crucially differentiates Wd-Initial Velar Fronting-3 in Eilsdorf from the fronting processes discussed in other varieties of German in previous chapters. In those earlier (LGm) case studies, the fronting of velars relates [x] and [ç] which do not contrast, e.g. Soest (§4.3), where [x] and [ç] are allophones, and in Elspe (§7.2), where the complementary distribution of word-initial [x] and [ç] is disrupted by the occurrence of the palatal quasi-phoneme [ç] (/ç/).

(16) Wd-Initial Velar Fronting-3:

$$_{\text{wd}}[\ \begin{bmatrix}-\textsc{son}\\+\textsc{cont}\end{bmatrix} \qquad [-\textsc{cons}]$$

$$[\textsc{dorsal}] \qquad [\textsc{coronal}]$$

Since fortis dorsal fricatives do not occur word-initially, it is not necessary to specify that the target for Wd-Initial Velar Fronting-3 be marked for a laryngeal feature. However, the trigger for that process is restricted to front vowels only. Were the trigger the set all coronal sonorants, then word-initial /ɣ/ would incorrectly surface as palatal in (13b).

Many words are attested with Umlaut alternations. The significance of those examples is that if the word begins with a lenis dorsal fricative, then that sound is realized as velar ([ɣ]) before a back vowel and as palatal ([ʝ]) before a front vowel. Representative examples are presented in (17). As indicated below, the sound underlying that alternation is /ɣ/, which shifts to the corresponding palatal by (16).[4]

(17) Word-initial [ɣ]~[ʝ] alternations (from /ɣ/):

a.	ʒåårə	[ɣɑːrə]	Garten	'garden'	342
	jęrtnęęr	[ʝɛrtnɛːr]	Gärtner	'gardener'	342
b.	ʒɑus	[ɣɑus]	Gans	'goose'	342
	jøsəln	[ʝœsəln]	kleine Gänse	'small geese'	342
c.	ʒååf	[ɣɑːf]	gab	'gave-PRET'	329
	jeeəbm	[ʝeːəbm̩]	geben	'give-INF'	342

The sound underlying the [ɣ]~[ʝ] alternation in (17) cannot be palatal (/ʝ/). If (16) were replaced with a neutralization converting word-initial /ʝ/ to [ɣ] before a back vowel then that process would incorrectly affect the /ʝ/ in words like [ʝʊŋk] (/ʝʊŋk/) from (14). The significance of the underlying velar is discussed in greater detail in §17.3.3.

The system described by Block in 1910 in which [ɣ] (/ɣ/) and [ʝ] (/ʝ/) contrast in word-initial position was the outgrowth of an earlier stage in which /ɣ/ surfaced as [ɣ] before any vowel; see Stage 1 in (18) for four representative examples showing that Eilsdorf illustrates pattern (5a). At some point during Stage 1, those velars succumbed to a coarticulatory (phonetic) fronting, which was then phonologized as an allophonic rule (Wd-Initial Velar Fronting-3) at Stage 2. At that point, word-initial [ɣ] surfaced in the neighborhood of a back vowel or consonant and word-initial [ʝ] in the neighborhood of a front vowel. When Glide Hardening altered underlying representations (Stage 3), contrasts between the new phonemic palatal /ʝ/ and the inherited velar phoneme /ɣ/ emerged in word-initial position before a full back vowel, as in the first and third example in (18).

[4] I ignore the idiosyncrasies in these Umlaut alternations (e.g. [ɑu] alternates with [œ]) because they are not relevant for my analysis. The important point is that the stem vowel in the second word in the two pairs is front and not back.

(18)

	/jɑː/	/ɣuːt/	/ɣɑːf/	/ɣeːəbm̩/	
	[jɑː]	[ɣuːt]	[ɣɑːf]	[ɣeːəbm̩]	Stage 1
	/jɑː/	/ɣuːt/	/ɣɑːf/	/ɣeːəbm̩/	
	[jɑː]	[ɣuːt]	[ɣɑːf]	[ʝeːəbm̩]	Stage 2
	/ʝɑː/	/ɣuːt/	/ɣɑːf/	/ɣeːəbm̩/	
	[ʝɑː]	[ɣuːt]	[ɣɑːf]	[ʝeːəbm̩]	Stage 3
	ja	*gut*	*gab*	*geben*	MoStGm
	'yes'	'good'	'gave-PRET'	'give-INF'	

The word [ɣuːt] 'good'– representative of data set (13) – shows that a word-initial velar remains velar in the phonetic representation and in the underlying representation at all three stages. The example [ʝɑː] 'yes'– representative of data set (14) – reveals that a new phoneme entered the language at Stage 3 (/ʝ/). That sound is a phonemic palatal because it contrasts with /ɣ/ before full back vowels. The words [ɣɑːf] 'gave-PRET' and [ʝeːəbm̩] 'give-INF' typify [ɣ]~[ʝ] alternations (as in 17). At Stage 2, /ɣ/ surfaced as [ʝ] before a front vowel in words like [ʝeːəbm̩] because the front vowel in /eːə/ belonged to the set of triggers for fronting. At Stage 3, the underlying representation for those alternating pairs did not change; hence, /ɣ/ from Stage 2 was inherited as /ɣ/ at Stage 3. Original /ɣ/ was likewise inherited in the nonalternating examples in (15).

The Eph pattern for word-initial dorsal fricatives in (13–15) is attested elsewhere in that dialect region. A representative example is the Eph variety of Lesse (Löfstedt 1933; Footnote 4.3), which is about 40 km from Eilsdorf. Löfstedt uses the same symbol for [ɣ] and [ʝ], although he is clear that the distribution of the two is a function of the following vowel. The data in (19) suggest that Lesse exemplifies (1b), although it appears that word-initial [ʝ] is unstable before a front vowel (Löfstedt 1933: 51).

(19) Word-initial dorsal fricatives in Lesse:

a.	ʒolt	[ɣolt]	Gold	'gold'	56
b.	ʒēbm̥	[ʝeːbm̩]	geben	'give-INF'	56
c.	glå̄s	[glɑːs]	Glas	'glass'	56
d.	jå̄r	[jɑːr]	Jahr	'year'	51

As in Eilsdorf, Lesse has a contrast between [ɣ] and [ʝ] in word-initial position before a full back vowel. Note that WGmc ⁺[ɣ] is realized as the velar stop [g] before a consonant (in 19c) and not as [ɣ], as in (19b).

To summarize, the data described above for word-initial dorsal fricatives in Eilsdorf (and Lesse) represent one pattern for Eph (see §8.4 for another pattern). That system is also well-represented in varieties of ELGm discussed in Chapter 11, e.g. Willuhnen (LPr; Natau 1937; Footnote 11.2), Kreis Bütow and Kreis Rummelsburg (EPo; Mischke 1936; Footnote 11.2).

8.4 Eastphalian (part 2)

Hille (1939) describes the Eph dialect of Dingelstedt am Huy (Footnote 4.3). The phonemic front and back vowels are /iː ɪ eː ɛː ɛ yː ʏ øː/ and /uː ʊ oː ɔ ɑː ɑ ə/ respectively. The phonemic diphthongs ending in a front vowel are /ɑːi oːy ʏø ɪe/ and the ones ending in a back vowel are /ɑːu ʊo/. Dingelstedt am Huy has the four dorsal fricatives [x ɣ ç ʝ], in addition to the stop [g], which is demonstrated below to be an allophone of /ɣ/. In word-initial position only [ʝ] and [g] surface, which both contrast before back vowels; that word-initial system is depicted in (20). In postsonorant position [x ɣ ç ʝ] pattern as in Eilsdorf (Map 2).

(20)

/ɣ/	/ʝ/
|	|
[g]	[ʝ]

Word-initial [g] (<WGmc ⁺[ɣ]) surfaces before a full back vowel (in 21a) or a consonant (in 21b). Recall from (13) that words like the ones in (21) are pronounced in Eilsdorf with an initial [ɣ]. The absence of items beginning with [g] followed by [oː ɔ] is accidental.

(21) Word-initial [g] (from /ɣ/):

a.	gūt	[guːt]	gut	‘good	30
	gus	[gus]	Guss	‘gush’	119
	gɑst	[gɑns]	ganz	‘quite’	101
	gɑist	[gɑːist]	Geist	‘intellect’	64
b.	glɑs	[glɑːs]	Glas	‘glass’	64
	glükkə	[glʏkə]	Glücke	‘fortune-PL’	66
	grɑs	[gʀɑːs]	Gras	‘grass’	64

In word-initial position before a back vowel, palatal [ʝ] (/ʝ/) likewise can occur (as in 22). The [ʝ] in examples like these is the etymological palatal. As in Eilsdorf (Map 3), in the context before schwa, [ʝ] (<WGmc ⁺[ɣ]) is present as a palatal quasi-phoneme, e.g. [ʝədɑŋkə] ‘thought’ (=⟦ʝədɑŋkə⟧).

(22) Word-initial [ʝ] (from /ʝ/):

jū	[ʝu:]	euer	'your-PL'	53
juŋk	[ʝʊŋk]	jung	'young'	27
jɑmmər	[ʝɑməʀ]	Jammer	'lament'	21
jɑ	[ʝɑ:]	ja	'yes'	101

Palatal [ʝ] – but never [g] – surfaces in word-initial position before a front vowel (see 23). The [ʝ] in these examples derives historically from WGmc +[ɣ]. As indicated here, I analyze the initial sound in (23) as an underlying velar.[5] The [ʝ] in these examples is a nonalternating palatal (like the corresponding Eilsdorf items in 15).

(23) Word-initial [ʝ] (from /ɣ/) in nonalternating words:

jē̜rn̥	[ʝɛ:ʀn̥]	gären	'ferment-INF'	42
jelt	[ʝɛlt]	Geld	'money'	24
jịejən	[ʝɪeʝən]	gegen	'against'	18

In word-initial position before a full back vowel, [g] and [ʝ] contrast. This is illustrated in the examples presented above in (21a) vs. (22), e.g. [gu:t] 'good' vs. [ʝu:] 'your-PL'. Items like these display the contrast between word-initial [ʝ] and word-initial [g] holds before the same full back vowels. Dingelstedt am Huy represents (1b), where [ɣ] in (1b) corresponds to [g].

That word-initial sequences like [gi] are systematic gaps is supported by alternating pairs like the ones in (24). The first word in each pair begins with [g] followed by a full back vowel and the second word shows the fronting of that back vowel to a front vowel via Umlaut. The important point is that the dorsal fricative is realized as [ʝ] before a front vowel.

(24) Word-initial [g]~[ʝ] alternations (from /ɣ/):

a.	gɑst	[gɑst]	Gast	'guest'	52
	jestə	[ʝɛstə]	Gäste	'guests'	52
b.	gɑus	[gɑ:us]	Gans	'goose'	52
	jössələ	[ʝœsələ]	Gänseküken	'goose chick'	52

I analyze the word-initial consonant in (23) and (24) as an underlying velar (/ɣ/). That sound shifts to [ʝ] before a front vowel by Wd-Initial Velar Fronting-3 (in 16) and elsewhere surfaces as [g] (see below for discussion). The trigger

[5]There are two words listed in the glossary of the original source (Hille 1939: 115–127) in which the etymological palatal occurs before a front vowel, namely [ʝi:] 'her' (=⟦jī ⟧) and [ʝɪedəʀ] 'every-MASC SG'(=⟦jịedər⟧).

for fronting must be the class of front vowels and not the class of coronal sonorants, otherwise word-initial /ɣ/ would incorrectly surface as [ʝ] before sounds like /l/ and /r/ (in 21b). As in Eilsdorf, the distribution of velars and palatals necessitates an underlying velar which surfaces as palatal and not an underlying palatal which is realized as velar. If the alternations in (24) were analyzed in the synchronic phonology with an underlying /ʝ/ which retracts to |ɣ| (→[g]) before a back vowel, then the /ʝ/ in (22) would incorrectly be affected as well.

It was noted above that Wd-Initial Velar Fronting-3 creates [ʝ] from /ɣ/ before a front vowel. Word-initial /ɣ/ in the elsewhere case (i.e. before a back vowel or consonant) surfaces as [g] by g-Formation-2 in (25). g-Formation-2 applies at the left edge of a word and not at the left edge of a syllable. The latter context cannot be correct because the /ɣ/ in a word-internal onset does not surfaces as [g], e.g. [fɔ.ɣəl] 'bird' (=⟦foggəl⟧).

(25) g-Formation-2:

$$\begin{bmatrix} -\textsc{son} \\ +\textsc{cont} \\ -\textsc{fortis} \\ \textsc{dorsal} \end{bmatrix} \rightarrow [-\text{cont}] \;/\; {}_{\text{wd}}[\,\_\_$$

Wd-Initial Velar Fronting-3 (Wd-In Vel Fr-3) and g-Formation-2 (g-Form-2) have a very different status in the synchronic phonology. Since the former eliminates the contrast between underlying velar and underlying palatal to the latter, it is a neutralization. However, g-Formation-2 applies to any word-initial /ɣ/ that has not undergone Wd-Initial Velar Fronting-3. That type of /ɣ/ can be present in words that alternate with [ʝ], as in (23), or in words that have no such alternation (e.g. in [glʏkə] 'fortune-PL' from /ɣlʏkə/ in 21b). g-Formation-2 is therefore an allophonic rule. As indicated in (26a), Wd-Initial Velar Fronting-3 bleeds g-Formation-2 in the second example.

(26) a.

	/ɣɑst/	/ɣɛst-ə/
Wd-In Vel Fr-3	—	ʝɛst-ə
g-Form-2	gɑst	—
	[gɑst]	[ʝɛstə]
	'guest'	'guests'

b.

	/ɣɑst/	/ɣɛst-ə/
g-Form-2	gɑst	gɛst-ə
Wd-In Vel Fr-3	—	—
	[gɑst]	*[gɛstə]

Were g-Formation-2 to precede Wd-Initial Velar Fronting-3 (see 26b), then the incorrect output would be obtained in the second example. Significantly, the ordering in (26b) is not counterbleeding. Instead, Wd-Initial Velar Fronting-3 bleeds g-Formation-2; hence, those two processes stand in a transparent (mutually bleeding) relationship (§2.2.4).

In (27) I provide three representative examples illustrating the development of dorsal sounds in word-initial position (as depicted in 5b). The first three stages are the same as the three stages presented earlier for Eilsdorf: Stage 1 represents the point where velars are phonologically [ɣ] even in the neighborhood of front sounds. Stage 2 depicts the point in the history of LGm before Glide Hardening, in which [ɣ] and [ʝ] stood in an allophonic relationship. At that stage the palatal surfaced word-initially only before a front vowel and the velar elsewhere. When Glide Hardening restructured the initial palatal to the phoneme /ʝ/, Wd-Initial Velar Fronting-3 operated as a neutralization (Stage 3A). The difference between Dingelstedt am Huy and Eilsdorf can be observed at Stage 3B: The former dialect is more innovative than the latter because it added g-Formation-2.

(27)	/jɑː/	/ɣɑst/	/ɣɛstə/	
	[jɑː]	[ɣɑst]	[ɣɛstə]	Stage 1
	/jɑː/	/ɣɑst/	/ɣɛstə/	
	[jɑː]	[ɣɑst]	[ʝɛstə]	Stage 2
	/ʝɑː/	/ɣɑst/	/ɣɛstə/	
	[ʝɑː]	[ɣɑst]	[ʝɛstə]	Stage 3A
	/ʝɑː/	/ɣɑst/	/ɣɛstə/	
	[ʝɑː]	[gɑst]	[ʝɛstə]	Stage 3B
	Ja	*Gast*	*Gäste*	MoStGm
	‘yes’	‘guest’	‘guests’	

The example [ʝɑː] ‘yes’– recall (22) – indicates that a new underlying dorsal fricative entered the language at Stage 3 (/ʝ/). That new palatal was a phoneme because it contrasted with /ɣ/ in words like [ɣɑst] ‘guest’. [gɑst] ‘guest’ and [ʝɛstə] ‘guests’ are representative of an alternating pair (see 24). At Stage 2, /ɣ/ surfaced as [ʝ] before a front vowel in items like [ʝɛstə] ‘guests’ because /ɛ/ belonged to the set of triggers for fronting. At Stage 3A, the underlying representation for those alternating pairs did not change; hence, /ɣ/ from Stage 2 was inherited as /ɣ/ at Stage 3A and Stage 3B.

The word-initial pattern described above for Dingelstedt am Huy in (21–24) is well-attested in LGm. Two very similar Eph varieties are presented in (28) and (29). The two dialects listed here exemplify (1b), although examples in Magdeburger Börde with word-initial [ɟ] before front vowels appears to be limited to names (Roloff 1902: 17).

(28) Magdeburger Börde (Roloff 1902; Footnote 4.3):

a.	gɑlə	[gɑlə]	Galle	'bile'	22
b.	gråm̩	[grɑm̩]	graben	'bury-INF'	18
c.	ję̣lt	[ɟɛlt]	Geld	'money'	21
d.	juŋk	[ɟuŋk]	jung	'young'	17

(29) Göddeckenrode and Isingerode (Lange 1963; Footnote 4.3):

a.	gaų̣s	[gɑʊs]	Gans	'goose'	227
b.	glā(ə)s	[glɑː(ə)s]	Glas	'glass'	227
c.	ję̄l	[ɟɛːl]	gelb	'yellow'	227
d.	juŋk	[ɟuŋk]	jung	'young'	208
	jīək	[ɟiːək]	Joch	'yoke'	208

ELGm varieties displaying a similar pattern include Lauenburg (EPo; Pirk 1928; Footnote 11.2), Kreis Saatzig (EPo; Kühl 1932; Footnote 11.2), Neumark (Brb; Teuchert 1907b,c; Footnote 11.1), Letschin (Brd; Teuchert 1930; Footnote 11.1), and Neu-Golm (Brb; Siewert 1912; Footnote 11.1). Those places are discussed in Chapter 11.

8.5 Eastphalian (part 3)

Schütze (1953) describes the Eph dialect once spoken in the community of Neuendorf (Footnote 4.3). The phonemic front and back vowels in that variety are /iː ɪ eː ɛ ɛː/ and /uː ʊ oː ɔ ɔː ɑ ə/ respectively. The dialect possesses the dorsal fricatives [x ç ɣ ɟ], of which [x ç ɟ] surface word-initially. This section concerns itself with the contrast between [x ç] in word-initial position, which is depicted in (30). The etymological palatal [ɟ] (/ɟ/) (<Wmc +[j]) is included for reference. I demonstrate below that [x] and the corresponding palatal [ç] contrast before front vowels, but only the velar occurs before back vowels, as in (1c). The changes that occurred in Neuendorf are shown below to exemplify pattern (6).

(30)

/x/	/ç/	/ɟ/
|	|	|
[x]	[ç]	[ɟ]

In word-initial position [x] occurs before a back vowel (in 31a) or consonant (in 31b) and [ç] before any front vowel (in 32). The word-initial dorsal fricatives in all of these examples derived historically from WGmc $^+$[ɣ], which is reflected as *g* in the MoStGm orthography in the third column. [x]~[ç] alternations are provided in (33). I discuss the correct underlying representations for the Neuendorf data below. There is no indication in the original source that there are constraints on the nature of the back vowel after [x] or the front vowel after [ç]. The kind of consonant after [x] is restricted to coronal sonorants.

(31) Word-initial [x] before back vowels or consonants:

a.	xolt	[xɔlt]	Gold	'gold'	32
	xǭn	[xɔ:n]	gehen	'go-INF'	10
	xɑwət	[xɑ:vət]	gut	'good'	32
b.	xlīk	[xli:k]	gleich	'same'	15
	xnǭdə	[xnɔ:də]	Gnade	'mercy'	22

(32) Word-initial [ç] before front vowels:

χītsiχ	[çi:tsiç]	geizig	'stingy'	32
χistərn	[çɪstərn]	gestern	'yesterday'	32
χēwl	[çe:vl̩]	Giebel	'gable'	9
χę̄l	[çɛ:l]	gelb	'yellow'	32

(33) Word-initial [x]~[ç] alternations:

a.	xūl	[xu:l]	Gaul	'horse'	17
	χīlə	[çi:lə]	Gäule	'horses'	18
b.	xot	[xɔt]	Gott	'God'	10
	χetərə	[çɛtərə]	Götter	'Gods'	46
c.	xɑns	[xɑns]	Gans	'goose'	27
	χenzə	[çɛnzə]	Gänse	'geese'	27

The etymological palatal [j] (/j/) occurs word-initially before front or back vowels, e.g. [jɔ:] 'yes'.

The data presented in (34b) indicate that Neuendorf also possesses many words in which [x] surfaces in word-initial position before a front vowel. As revealed in the MoStGm orthography, the [x] in those examples derived historically from WGmc $^+$[ɣ] followed by [r] (by r-Deletion in 7). The examples in (34a) illustrate that r-Deletion also occurred between [x] and a back vowel. Observe that r-Deletion has the function of creating opaque velar plus front vowel sequences in (34b).[6]

[6]The final item in (34b) derives from OSax *grīpan*.

(34) Word-initial [x] before back vowels or front vowels:

a.	xunt	[xʊnt]	Grund	‘reason’	11
	xošn	[xɔʃn̩]	Groschen	‘penny’	26
	xof	[xɔf]	grob	‘rough’	48
	xōwə	[xoːvə]	grobe	‘rough-INFL’	48
	xǭs	[xɔːt]	groß	‘large’	26
	xoin	[xoin]	grün	‘green’	26
	xɑf	[xɑf]	Grab	‘grave’	26
b.	xīs	[xiːs]	grau	‘gray’	15
	xīpm	[xiːpm̩]	greifen	‘grasp-INF’	15
	xitə	[xɪtə]	Grütze	‘groats’	26
	xēln	[xeːln]	grölen	‘bellow-INF’	28
	xetər	[xɛtər]	größer	‘bigger’	20
	xę̄pm	[xɛːpm̩]	Mistgabel	‘pitchfork’	18

Note that Neuendorf possesses words with [x]~[ç] alternations (in 33) as well as words without such an alternation, e.g. [xɔːt] ‘large’ vs. [xɛtər] ‘bigger’ (in 34).[7]

The significance of the Neuendorf data is that [x] and [ç] contrast in word-initial position before a front vowel; see (32) vs. (34b). It is not difficult to find examples where [x] and [ç] contrast before the same front vowel, e.g. [çiːtsɪç] ‘stingy’ vs. [xiːs] ‘gray’.

Schütze (1953) gives every indication that r-Deletion is an exceptionless, Neogrammarian-style sound change. I contend that r-Deletion altered underlying representations from one generation to the next. Thus, an older generation of speakers retained the [r], while the younger and clearly more innovative generation does not, e.g. [xrɪs] /xrɪs/ shifted to [xɪs] /xɪs/. The latter underlying representations are the ones present in the grammar of the informants for Schütze (1953).

In (35) I give representative examples for phonetic and underlying representations for all of the datasets presented above. In the context before a front vowel, [ç] and [x] contrast, and hence, they are phonemic (see 35c vs. 35e). (35f) represents [x]~[ç] alternations. Velar /x/ cannot be the underlying sound in that type of alternation, otherwise velar fronting (triggered by all front vowels) would incorrectly convert the /x/ in words like (35e) into [ç]. For this reason the underlying

[7]The [x]~[ç] alternations in (33) are nouns, but the one example of a nonalternating pair referred to here is an adjective. I do not consider the lexical category to be significant. The reason the [x] in [xɔːt] ‘large’ fails to alternate with [ç] in [xɛtər] ‘larger’is that the [x] in the latter word was once followed by [r] and not that it is an adjective.

representation of the initial sound is /ç/ (see 35f). In the context before a back vowel or consonant in nonalternating morphemes, surface [x] is underlyingly /x/ (see 35a,b,d). Note that /x/ is inherited without change from earlier /x/. See below for discussion.

(35)	a.	[xɔlt]	/xɔlt/	'gold'	(=31a)
	b.	[xliːk]	/xliːk/	'same'	(=31b)
	c.	[çɛːl]	/çɛːl/	'yellow'	(=32)
	d.	[xʊnt]	/xʊnt/	'reason'	(=34a)
	e.	[xiːs]	/xiːs/	'gray'	(=34b)
	f.	[xɑns]	/çɑns/	'goose'	(=33c)
		[çɛnzə]	/çɛnzə/	'geese'	(=33c)

Significantly, Neuendorf does not possess any version of word-initial velar fronting, but instead a rule backing a word-initial palatal, which I state in (36). Wd-Initial Palatal Retraction is a neutralization because it suspends the contrast between /x/ and /ç/ to [x]. I discuss the way in which that process might be analyzed featurally in §8.6.2.

(36) Wd-Initial Palatal Retraction:
/ç/ → [x] / $_{\text{wd}}$[___ back vowel

Neuendorf is the only variety of German discovered in the present survey requiring a rule backing a palatal rather than one fronting a velar. Since the dialect as it was described in 1953 represents the outgrowth of an earlier one in which a velar fronted to palatal, the conclusion is that rule inversion transpired (Vennemann 1972, McCarthy 1991, Blevins 2004, Hall 2009b). In the following, I discuss how the original rule of velar fronting inverted itself into Wd-Initial Palatal Retraction.[8]

The emergence of the word-initial velar vs. palatal contrast as it was described in 1953 (= 6) is illustrated with the four representative examples in (37). WGmc $^{+}$[ɣ] (/ɣ/) was restructured to [x] (/x/) by Wd-Initial ɣ-Fortition, which surfaced consistently as velar at Stage 1. At Stage 2, Wd-Initial Velar Fronting-3 (in 16) was phonologized as an allophonic process; hence, the /x/ in /xenzə/ was realized

[8]On the basis of data from English dialects involving intrusive-r, McCarthy (1991) argues that true rule inversion (i.e. the replacement of the original rule of r-Deletion with r-Epenthesis) never occurred. Instead, the original deletion exists side by side with the innovative rule of r-Deletion. In contrast to those English dialects, true rule inversion occurred in Neuendorf. For discussion of McCarthy's claim, the reader is referred to Hall (2009b).

as [ç] because that sound was followed by a front vowel, but the same sound surfaced as [x] before a back vowel or consonant. When r-Deletion restructured underlying representations at Stage 3 without /r/ as in the final two examples, [x] and [ç] contrasted in word-initial position before a front vowel.

(37)

/xɑns/	/xɛnz-ə/	/xrɔːt/	/xrɛt-ər/	
[xɑns]	[xɛnzə]	[xrɔːt]	[xrɛtər]	Stage 1
/xɑns/	/xɛnz-ə/	/xrɔːt/	/xrɛt-ər/	
[xɑns]	[çɛnzə]	[xrɔːt]	[xrɛtər]	Stage 2
/çɑns/	/çɛnz-ə/	/xɔːt/	/xɛt-ər/	
[xɑns]	[çɛnzə]	[xɔːt]	[xɛtər]	Stage 3
Gans	*Gänse*	*groß*	*größer*	MoStGm
'goose'	'geese'	'large'	'larger'	

The contrast between [x] and [ç] at Stage 3 is significant for two reasons. First, it triggered the phonemicization of /ç/ followed by a front vowel in every example given above. That restructuring therefore occurred in [çɛːl] 'yellow' (in 35c) without a [x]-alternant, as well as in [çɛnzə] 'geese', which alternates with [x] in [xɑns] 'goose'. Since the original /x/ was restructured to /ç/ in [çɛnzə], the /x/ in the alternant with [x] before a back vowel was likewise restructured, i.e. [xɑns] /xɑns/ > [xɑns] /çɑns/. By contrast, historical /x/ in nonalternating morphemes (in 35a,b,d) is inherited at Stage 3 without change as /x/. Note that /x/ is the underlying sound here even though [x] never contrasts with [ç] in word-initial position before a back vowel. The same reasoning has been applied to underlying representations in languages like German with fortis-lenis alternations. Thus, underlying representations with a lenis sound are posited for alternating morphemes, e.g. final /d/ in [hʊnt] 'dog' vs. [hʊndə] 'dogs', but underlying representations with fortis sounds are postulated in nonalternating morphemes, e.g. /t/ in [ʃtɑt] 'city' (Kiparsky 1982a: 17 and subsequent work by many authors).

The second reason [x] and [ç] is significant is that it led to rule inversion. In all likelihood rule inversion in Neuendorf was abrupt. As noted above, Schütze's description of Neuendorf suggests that r-Deletion was a regular (exceptionless) change. Since there was a large number of new r-less words like [xɛtər] 'bigger' (from 34b) and since there were no restrictions on the type of front stem vowel situated after the deleted rhotic, language learners were confronted a plethora of [x] vs. [ç] contrasts. Those contrasts led to the restructuring of /x/ to /ç/ in pairs of words like [çɛnzə] 'geese' and [xɑns] 'goose'. The earlier allophonic process of Wd-Initial Velar Fronting-3 was consequently replaced with Wd-Initial Palatal Retraction.[9]

The word-initial pattern for Neuendorf is apparently unique; no other variety has with contrastive [ç] and [x] in word-initial position has been discovered, nor is r-Deletion attested in other dialects. The varieties of German spoken closest to Neuendorf are Reinhausen (Eph; Jungandreas 1926, 1927; Footnote 4.3) in Lower Saxony (Niedersachsen) and Leinefelde (Thrn; Hentrich 1905; Footnote 7.2) in Thuringia (Thüringen). In Reinhausen WGmc ⁺[ɣ] is realized in word-initial position allophonically as [x] before back vowels and [ç] before front vowels or coronal consonants, although the palatal quasi-phoneme /ç/ occurs word-initially before /ʀ/. However, [x] and [ç] do not contrast in initial position. As in other Thrn dialects (and MoStGm), the reflex of word-initial WGmc ⁺[ɣ] is [g] in Leinefelde.

8.6 Discussion

8.6.1 Velar Fronting as a Neogrammarian change

Velar fronting was phonologized in word-initial position as an allophonic process in all of the Eph varieties discussed above, but Glide Hardening caused its status to change to a neutralization in both Eilsdorf and Dingelstedt am Huy. One point not discussed earlier concerns the exceptionless nature of velar fronting. Thus, WGmc ⁺[ɣ] shifted to palatal in word-initial position before a front vowel in true Neogrammarian fashion, meaning that there were no deviant items with a word-initial ⁺[ɣ] followed by a front vowel. That allophonic processes – both synchronic and diachronic – are exceptionless is hardly surprising, but the exceptionless nature of word-initial velar fronting has apparently continued even after the rule morphed into a neutralization. Examples were provided earlier for morphemes alternating between velar and palatal depending on whether or not the stem vowel showed the effects of a stem vowel mutation such as Umlaut (in 15 for

[9] In postsonorant position the four dorsal fricatives of Neuendorf are [x ç ɣ ʝ]. The basic pattern is that the palatals surface after coronal sonorants and the velars after back vowels; recall the Eph variety of Dorste (§4.4). However, Schütze (1953) also lists several words in her grammar with opaque palatals, such as [ç] after a back vowel that was historically front, e.g. [dɑːç] 'dough' (=⟦dɑχ⟧). Opaque palatals like those are underlying (/ç/) and not derived; see Chapter 9 for similar examples from other dialects. As I demonstrate in Chapter 9, in dialects where [x] and [ç] contrast after a back vowel velar fronting is present as a rule of neutralization in word pairs with Umlaut alternations (cf. MoStGm [bɑx] 'stream' vs. [bɛçə] 'streams'). Since Neuendorf contrasts [x] and [ç] after a back vowel, velar fronting is present in the synchronic grammar in postsonorant position. Thus, rule inversion occurred in Neuendorf only in word-initial position.

Eilsdorf and 24 for Dingelstedt am Huy). By definition, Umlaut is irregular in the sense that it is difficult if not impossible to predict which morphemes undergo fronting in which morphological context, but the point is that if the umlauted allomorph of a stem is present, then the velar fricative preceding that fronted vowel always shifts to palatal. The exceptionless nature of neutralizations is not unattested in the languages of the world, but many linguists have observed that the shift in status from a rule relating allophones to a neutralization often correlates with other changes, including the emergence of idiosyncratic exceptions, as well as the restriction of the rule to derived environments. One example discussed in the literature involves the progression from the originally allophonic rule which voiced (lenited) fricatives /f s θ/ to [v z ð] in OE to the phonemicization of /v z ð/ and then to the morphologization of the rule in ME (Ringe & Eska 2013: 141–144; Minkova 2014: 89–98). The conclusion drawn on the basis of the material discussed above (and below) is that the correlation described above does not hold in German dialects.

8.6.2 Irregularities and analogy

Both Block (1910) and Hille (1939) have identified a very small number of items in their respective dialects which contain a word-initial palatal [ʝ] (<WGmc ⁺[ɣ]) which is historically opaque because it stands before a back vowel. Those opaque examples can be placed into two categories. In the first are words where the palatal can be shown to have undergone velar fronting because the back vowel was originally front. In the second type the palatal did not undergo velar fronting because the back vowel was always back.

The number of words belonging to both categories is very small. For Eilsdorf I have found one belonging to the first category and four in the second. The numbers are similar for Dingelstedt am Huy. With this in mind, consider the two examples in (38) from Eilsdorf (Block 1910):

(38)	a.	jṳŋk	[ʝʊŋk]	ging	‘went-PRET’	342
	b.	jṳlt	[ʝʊlt]	galt	‘was valid-PRET’	342

The corresponding OSax etymon *gieng* ‘went-PRET’ reveals that the fricative in (38a) was followed by a historical front vowel. The change from front vowel to back vowel ([ʊ]) in that word can be thought of as specific instance of Vowel Retraction (recall 8). From a formal point of view, the palatal in (38a) arose just as palatal quasi-phonemes (Chapter 7): The feature [coronal] of the front vowel of the stem was simultaneously linked to the preceding palatal sound. When the front stem vowel was restructured to a back vowel by Vowel Retraction, the feature [coronal] was delinked from the vowel but remained anchored to the palatal, thereby creating the phoneme /ɟ/. That new phonemic palatal has an opaque history because it shows that Vowel Retraction counterbled velar fronting.

Consider now (38b). The [ɟ] in that item was likewise a historical velar (< WGmc ⁺[ɣ]), but it cannot have come about by the sound change that created the palatal in (38a) because the stem vowel in (38b) was always back (cf. OSax *gald*). The question is simple: What is the explanation for the emergence of the irregular palatal in (38b)?

The answer did not involve velar fronting in any sense of the word. There are two related reasons for why the palatal in (38b) has an explanation that lies outside of the domain of phonology and for why its emergence therefore does not fall into the scope of the present book. First, the change from velar to palatal before a back vowel only occurs in three other words in the Eilsdorf dialect, but that development failed to affect the [ɣ] in all other items beginning with [ɣ]; recall the examples in (13a) which are representative of a much larger class of words. Second, the change from velar to palatal in (38b) occurs in the context before a back vowel, but both the historical rule (Wd-Initial Velar Fronting-3) and the corresponding synchronic rule apply as assimilations, i.e. before front vowels. One cannot deny that there was a true sound change transforming a velar (WGmc ⁺[ɣ]) to palatal [ɟ] in word-initial position before any segment, including back vowels (Chapter 14). However, as discussed in that chapter, that nonassimilatory development was a true Neogrammarian sound change which applied in many LGm and CGm varieties without exception.

I consider the most reasonable explanation for the irregular palatal in (38b) to be analogy: The original velar in (38b) was restructured to a palatal (/ɟ/) under the influence of the [ɟ] in morphologically-related words, e.g. [ɟɪln] 'be valid-INF'. But analogy is not phonology. This means that any and all analogical developments involving the change from velar to palatal – changes that were irregular by definition – lie outside the domain of this book because they did not involve velar fronting.

8.6.3 Rule inversion

The originally allophonic process of velar fronting had a very different fate in Neuendorf. As in Eilsdorf and Dingelstedt am Huy, WGmc ⁺[ɣ] shifted to palatal in word-initial position before a front vowel in Neuendorf, but when r-Deletion restructured underlying representations, the velar vs. palatal contrast before front vowels led to the restructuring of word-initial /x/ to /ç/ in [x]~[ç] alterations.

As described above, one of the consequences of that restructuring was rule inversion; hence, Wd-Initial Velar Fronting-3 was replaced with Wd-Initial Palatal Retraction.

Rule inversion has been discussed in a number of works cited earlier (Vennemann 1972, McCarthy 1991, Blevins 2004, Hall 2009b). One generalization discussed in that literature is that inverted rules are often typological oddities, two examples being English r-Epenthesis (Map 8) and Imst German Buccalization (/h/⟶[x] /__ $]_{\mathrm{wd}}$; Hall 2009b, 2010, 2009b, 2011a). The inverted rule of Wd-Initial Palatal Retraction in Neuendorf may strike the reader as a counterexample, since it appears to be a clear-cut case involving the assimilation of a front sound to a back sound in the neighborhood of back vowels. However, the featural system adopted in this book does not allow one to characterize that process as an assimilation. The reason is that palatals like /ç/ are [coronal] and [dorsal], velars like /x/ are simplex [dorsal], while back vowels are [dorsal]. The change from /ç/ to [x] in the neighborhood of a back sound therefore requires [coronal] to delete in the context of a complex [coronal, dorsal] sound, clearly a textbook case for an ad hoc change.

One might conclude that the featural conundrum described above can be solved by simply replacing that presumably defective featural system with one which enables Wd-Initial Palatal Retraction to be expressed as an assimilation. Two points suggest that a reanalysis along those lines would not be prudent. First, (36) is the only example attested in the present survey requiring that a palatal shift to velar, while all other varieties necessitate some version of velar fronting (both word-initial and in postsonorant position). Second, Wd-Initial Palatal Retraction is the product of rule inversion. Since inverted processes are known to be CRAZY RULES (Bach & Harms 1972), I opt to retain the featural system and postulate that palatal to velar retraction rules like the one in (36) do not involve an assimilation. That treatment derives support from the typological literature on palatalizations, which is silent on whether or not there are rules attested in natural languages that must involve a palatal changing into a velar.[10]

[10] Since (36) does not involve a palatalization according to any definition of the word, it is understandable that the typological literature on palatalizations (§2.3) has not investigated that type of change. One work to my knowledge in which the change from palatal to velar is discussed from the cross-linguistic perspective is Kümmel (2007: 241–243). However, his examples involve unconditioned changes or dissimilations. Noticeably absent from his list are languages with rules changing a palatal to a velar in the neighborhood of all back vowels. Kümmel's material is drawn from Semitic, Indo-European, and Uralic, but no comparable study is known to me at present which addresses the issue (i.e. cases of assimilation of palatals to velars) with a broader source of languages. I consider this to be a potentially promising area for future research.

8.7 Areal distribution of word-initial phonemic palatals

The survey of German dialects in this chapter indicates that phonemic palatals in word-initial position are well-attested throughout northern Germany. Several of the dialects investigated in Chapter 11 can be added to the list as well. Tables 8.1, 8.2, and 8.3 list varieties of German exemplifying one of the three contrast types defined in §8.1. The EPo, LPr, and HPr varieties listed below are indicated on Footnote 11.2. All of the places listed in Tables 8.1, 8.2, and 8.3 are plotted on Footnote 8.1.

Table 8.1: Varieties of WLGm and WCGm illustrating Contrast Type A

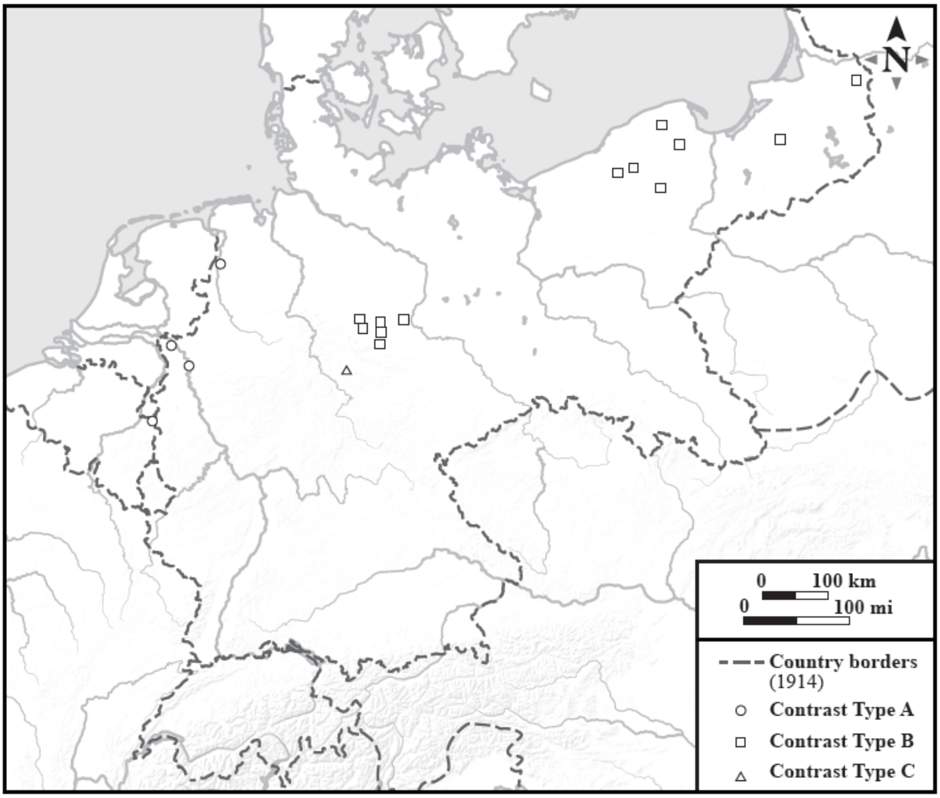
Place	Dialect	Source
Lathen	NLGm	Schönhoff (1908)
Homberg	LFr	Meynen (1911)
Kalkar	LFr	Hanenberg (1915)
Ronsdorf	Rpn	Holthaus (1887)
Montzen	Rpn	Welter (1933)

Table 8.2: Varieties of LGm and HPr illustrating Contrast Type B

Place	Dialect	Source
Magdeburger Börde	Eph	Roloff (1902)
Eilsdorf	Eph	Block (1910)
Cattenstedt	Eph	Damköhler (1919)
Lesse	Eph	Löfstedt (1933)
Dingelstedt am Huy	Eph	Hille (1939)
Isingerode/Göddeckenrode	Eph	Lange (1963)
Kreis Konitz	EPo	Semrau (1915a,b)
Lauenburg	EPo	Pirk (1928)
Kreis Bütow	EPo	Mischke (1936)
Kreis Rummelsburg	EPo	Mischke (1936)
Kamnitz	EPo	Tita 1921 [1965]
Willuhnen	LPr	Natau (1937)
Reimerswalde	HPr	Kuck & Wiesinger (1965)

Table 8.3: Variety of Eph illustrating Contrast Type C

Place	Dialect	Source
Neuendorf	Eph	Schütze (1953)



Map 8.1: Areal distribution of word-initial velar vs. palatal contrasts. Circles represent a contrast between velar ([ɣ]) and palatal ([ʝ]) in word-initial position before front and back vowels. Squares represent a word-initial contrast between velar ([ɣ] or [g]) and palatal ([ʝ]) before back vowels and triangles a word-initial contrast between velar ([x]) and palatal ([ç]) before front vowels.

An examination of some of the varieties of German spoken in the vicinity of the ones listed in Table 8.1 may uncover additional examples of Contrast Type A. Since the phonemic palatals in Contrast Type B arise historically when a trigger for velar fronting is eliminated a more in-depth investigation of the regions affected by the sound changes listed in (4) may reveal significant generalizations concerning the areal distribution of word-initial phonemic palatals like the ones in Table 8.2. To the best of my knowledge, Neuendorf is the only variety of German exemplifying Contrast Type C.

8.8 Conclusion

The case studies discussed above are characterized by word-initial contrasts between velars and palatals. In Chapter 9 discusses the ways in which velar vs. palatal contrasts can arise in postsonorant position. There it is argued that a phonemic split as in (4) is triggered in many varieties by Vowel Retraction. In contrast to the dialects discussed above, opaque palatals resulting from Vowel Retraction are not the result of a sporadic change, but instead represent general developments in postsonorant position. In Chapter 10 I discuss a merger similar to the one in (5) which led to the phonemicization of the original palatal fricative allophone.

One issue not directly related to the topic of phonemicization concerns the set of triggers for velar fronting. In Eilsdorf and Dingelstedt am Huy the rule in question (Wd-Initial Velar Fronting-3) is induced by the set of all front vowels; however, examples from other varieties of German discussed in this book point to a broader context for fronting, namely before front vowels or coronal consonants (e.g. Wd-Initial Velar Fronting-6 in Elspe and Schieder-Schwalenberg in §7.2). In any case, both the narrow set of triggers and the broader set of triggers involve assimilatory changes, which stand in contrast to the German varieties investigated in Chapter 13. In that chapter I demonstrate that many dialects are attested in which word-initial velars (e.g. WGmc $^{+}$[ɣ]) regularly shifted to the corresponding palatals in word-initial position before any type of segment, i.e. front vowels, coronal consonants, and (most significantly) back vowels. That type of change is important because it represents the regular nonassimilatory fronting of velars.

9 Phonemicization of palatals (part 2)

9.1 Introduction

The present chapter probes dialects in which velars and the corresponding palatals contrast in postsonorant position. The case studies discussed below all have in common that the velar vs. palatal contrast occurs after certain back vowels, but not after front vowels, where only the palatal surfaces. That system is the mirror-image of the word-initial one referred to in Chapter 8 as Contrast Type B. The two Contrast Type B systems investigated below for postsonorant position are depicted in (1), where [i] and [ɑ] are cover symbols for front vowels and back vowels respectively. The dorsal fricatives in (1a) are fortis [x ç] and the ones in (1b) are the lenis counterparts ([ɣ ʝ]).

(1) Contrast Type B:

a.	[...iç...]	[...ɑç...]	b.	[...iʝ...]	[...ɑʝ...]
		[...ɑx...]			[...ɑɣ...]

The palatal vs. velar contrasts in (1) are the consequence of the phonemic split depicted in (2):

(2) Phonemic split in postsonorant position (Vowel Retraction):

/Ve/	>	/Ve/		>	/Ve/	/Pa/
[Ve]		[Ve]	[Pa]		[Ve]	[Pa]

At Stage 1 the velar is realized as velar regardless of the nature of the preceding sound. At Stage 2 the same velar develops a palatal allophone in the context after coronal sonorants (or some subset thereof). The palatal allophone at Stage 2 is then phonemicized (/ç/ or /ʝ/) at Stage 3 when one or more front vowel triggering the palatal allophone at Stage 2 was restructured to a back vowel by Vowel Retraction (Chapter 7, Chapter 8). As a result of that change, the velar and the palatal contrast in the context after certain back vowels. Note that the opaque post-back vowel palatal exemplifies the historical overapplication of velar fronting; recall Figure 2.11.

As described in Chapter 8, the phonemicization of the palatal at Stage 3 did not lead to the loss of velar fronting. Instead, that rule remains in that system as a rule of neutralization applying in the context after front segments.

In §9.2 and §9.3 I discuss several Contrast Type B varieties of CHes and RFr illustrating the phonemic split depicted in (2). In §9.4 I consider two questions, namely the status of Contrast Type A and Contrast Type C systems attested in word-initial position (Chapter 8) for postsonorant position and the relationship between the quasi-phonemicization of palatals and phonemic palatals. In §9.5 I discuss the areal distribution of German dialects with a contrast between post-sonorant velar and palatal fricatives. The chapter concludes in §9.6.

9.2 Central Hessian

Contrasts between [x] and [ç] after certain back vowels (=Contrast Type B in 1a) are attested in several varieties of CHes, a point stressed throughout the survey of Hessian vocalism in R. D. Hall (1973: 30–34; 48). In this section I consider five representative varieties.[1]

Kroh (1915) describes the dialect spoken in Wissenbach (Footnote 7.1), which has the phonemic front vowels /iː i eː e ɛ/ and back vowels /uː u oː o ɔː ɔ ɑː ɑ/. Velars ([x ɣ]) contrast with the corresponding palatals ([ç ʝ]). The four phonemic dorsal fricatives are listed in (3). Not depicted here is [g], which is phonemic (/g/) because it contrasts with both [ɣ] and [x]. In word-initial position the only dorsal fricative that surfaces is the etymological palatal [ʝ].

(3)

/x/	/ç/	/ɣ/	/ʝ/
|	|	|	|
[x]	[ç]	[ɣ]	[ʝ]

Although velars contrast with the corresponding palatals after certain back vowels, only palatals occur after a coronal sonorant.

[1] I only discuss oral vowels, concentrating primarily on monophthongs. Nasalized vowels are ignored below because not enough data are presented in the original sources where those vowels are followed by dorsal fricatives to arrive at conclusions concerning the distribution of the latter sounds. The occurrence of dorsal fricatives after schwa (/ə/) and diphthongs are not considered in detail because palatals and velars typically do not contrast after those vocalic sounds.

The examples in (4) indicate that [x] (=⟦x⟧) surfaces after a back vowel. No examples were found in Kroh (1915) in which [x] occurs after [uː oː o]. These are accidental gaps.

(4) Wissenbach [x] (from /x/):

a.	šbrux	[ʃprux]	Spruch	'saying'	110
	hǭx	[hɔːx]	zweizinkige Hacke	'two-pronged hoe'	86
	fǫxə	[fɔxə]	fauchen	'hiss.INF'	92
	ɑx	[ɑːx]	auch	'also'	95
	dɑx	[dɑx]	Dach	'roof'	70
b.	blę^{ɑ}x	[blɛɑx]	Blech	'tin'	76

The items in (4a) have in common that the back vowel before [x] is etymologically back, while the diphthong [ɛɑ] in (4b) was etymologically front (e.g. MHG *blech*). For most of the examples given below the nature of the stem vowel (front vs. back) can be inferred from MoStGm spelling.

The data in (5) exemplify the occurrence of the opaque palatal [ç] (=⟦χ⟧) after a back vowel ([ɑː ɑ ɔː ɔ]). The back vowels in the first column all derived historically from front vowels.[2]

(5) Wissenbach [ç] (from /ç/):

a.	blɑχ	[blɑːç]	bleich	'pale'	94
	wɑχ	[vɑːç]	weich	'soft'	94
b.	glɑχ	[glɑç]	gleich	'same'	89
	dɑχ	[dɑç]	Deich	'dike'	89
c.	ɑχ	[ɑç]	ich	'I'	81
	mɑχ	[mɑç]	mich	'me'	81
d.	šǭχə	[ʃɔːçə]	scheuchen	'shoo.INF'	97
e.	lǫχdə	[lɔçtə]	Leuchte	'light'	97

The items listed in (4a) and (5) illustrate a contrast between [x] (/x/) and [ç] (/ç/) after the back vowels [ɑː ɑ ɔː ɔ]. Minimal pairs are not uncommon, e.g. [dɑx] 'roof' vs. [dɑç] 'dike'.

Additional items illustrating the occurrence of opaque [ç] after [ɑ] are provided in (6). Unlike the words in (5b,c), the original tonic vowel in (6) was back

[2] Behaghel (1911: 729) may have been the first linguist to observe that the ich-Laut occurs in certain varieties of Hes after back vowels ([ɑ]) that derived historically from diphthongs ending in a front vowel ([ɑi]).

(cf. MHG [ɑ]). However, I show below in (16) that there is evidence that the original back vowel shifted to a diphthong ending in a front vowel ([ɑi]) before reducing to the monophthong [ɑ].

(6) Wissenbach [ç] (from /ç/):

maχd	[maçt]	macht	'does-3SG'	74
maχst	[maçst]	machst	'do-2SG'	74
haχəl	[haçəl]	Hechel	'hatchel'	74

The following examples exemplify [x]~[ç] alternations in singular vs. plural pairs. Note that the stem vowels in (7) are back in both the singular and the plural. Significantly, the dorsal fricative is [ç] in the plural even though the preceding vowel is back. It is clear from the original source that back stem vowels in the singular regularly undergo fronting (Umlaut) before *-er* plurals if the consonant following that vowel is not an original velar, e.g. ⟦flǫs⟧ 'raft' ~ ⟦flęsər⟧ 'rafts' (Kroh 1915: 123–124). However, if the consonant after the original back stem vowel is a velar (e.g. [x]) then its fronted counterpart was once a diphthong ending in a front vowel which was later deleted, e.g. [dɑxər] > [dɑiçər] > [dɑçər], as noted above for (6).

(7) Wissenbach [x]~[ç] alternations (from /x/ or /ç/):

a.	dɑx	[dɑx]	Dach	'roof'	70
	daχər	[dɑçər]	Dächer	'roofs'	74
b.	lǫx	[lɔx]	Loch	'hole'	81
	lǫχər	[lɔçər]	Löcher	'holes'	83
c.	šdrǫx	[ʃtrɔx]	Strauch	'shrub'	92
	šdrǫχə	[ʃtrɔçə]	Sträucher	'shrubs'	92

As indicated above, I analyze the dorsal fricatives as either /x/ or /ç/, e.g. /dɑx/ 'roof' and /dɑç-ər/ 'roofs' for (7a).

A very different set of [x]~[ç] alternations is presented in (8). Observe that the stem vowel is back before [x] and front before [ç] (via Umlaut).

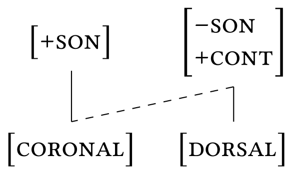
(8) Wissenbach [x]~[ç] alternations (from /x/):

a.	bux	[bux]	Buch	'book'	90
	biχər	[biçər]	Bücher	'books'	91
b.	brǭxdə	[brɔːxtə]	brachte	'brought-PRET'	87
	brę̄χdə	[brɛːçtə]	brächte	'brought-SUBJ'	87

c.	rɑx	[rɑːx]	Rauch	‘smoke’	95
	rǭiχərn	[rɔːiçərn]	räuchern	‘smoke.INF’	96

I analyze the underlying sound in the [x]~[ç] alternations in (8) as /x/, which surfaces as [ç] after a front vowel by Velar Fronting-1, which is reproduced in (9):

(9) Velar Fronting-1:



The sound underlying the [x]~[ç] alternations in (8) must be velar /x/ in the synchronic phonology and not palatal /ç/. If (9) were replaced with a neutralization retracting /ç/ to [x] after a back vowel then that process would incorrectly affect the /ç/ after [ɑː ɑ ɔː ɔ] in words like the ones in (5–7), e.g. [dɑçər] (/dɑç-ər/) ‘roofs’.

There is no contrast between [x] and [ç] after a coronal sonorant. Velar Fronting-1 is therefore a neutralization because the contrast between [x] and [ç] is suspended in favor of [ç] after any front vowel, e.g. [i ɛː ɔːi] in (8). The neutralization property crucially differentiates Velar Fronting-1 in Wissenbach from the fronting processes discussed in earlier chapters which relate noncontrasting [x] and [ç].

The data in (10) illustrate that [ç] – but never [x] – also occurs after a coronal sonorant in morphemes that have no [x] alternant. The front vowels in (10a) and coronal sonorant consonants like [l] in (10b) were historically front (coronal) sounds, as suggested by the MoStGm forms in the third column. No examples were found in in Kroh (1915) in which [ç] occurs after [iː eː e]. These gaps are accidental.

(10) Wissenbach [ç] (from /x/):

a.	jiχd	[ɟiçt]	Gicht	‘gout’	79
	šlęχd	[ʃlɛçt]	schlecht	‘bad’	76
b.	melχ	[melç]	Milch	‘milk’	119

I analyze the underlying sound in nonalternating morphemes like the ones in (10) as velar (/x/). The reason palatal /ç/ is not the underlying sound is that there is no contrast between palatals and the corresponding velars after coronal sonorants (recall 1a). Put differently, dorsal fricatives are predictable palatal in the context after a coronal sonorant.

The items in (11) illustrate the occurrence of [ɣ] after a back vowel (which was also historically back), while the data in (12) reveal that there is also an opaque [ʝ], which surfaces after the back vowel [ɑː]. The back vowel in question ([ɑː]) derived historically from a front vowel (cf. MHG [ei]). The [ɣ] and [ʝ] in (11) and (12) are modern reflexes of WGmc $^{+}$[ɣ].

(11) Wissenbach [ɣ] (from /ɣ/):

mǭɣə	[mɔːɣə]	Magen	'stomach'	120
ɑɣ	[ɑːɣ]	Auge	'eye'	120

(12) Wissenbach [ʝ] (from /ʝ/):

ɑjə	[ɑːʝə]	eigen	'own'	94
dɑjiχ	[dɑːʝiç]	teigig	'doughy'	94
rɑjər	[rɑːʝər]	Reiher	'heron'	94

Significantly, [ʝ] contrasts with [ɣ], which also surfaces after the same two back vowels, e.g. in the minimal pair [ɑːɣə] 'eyes' vs. [ɑːʝə] 'own'.

Many morphemes exhibit [g]~[ʝ] alternations, as in (13). The [g] and [ʝ] in words like these derived historically from WGmc $^{+}$[ɣ].

(13) Wissenbach [g]~[ʝ] alternations (from /ɣ/):

a.	bədrug	[bədrug]	betrog	'cheated-PRET'	121
	bədreijə	[bədreiʝə]	betrügen	'cheat.INF'	121
b.	šwig	[ʃvig]	schwieg	'was silent-PRET'	121
	šwɑijə	[ʃvɑiʝə]	schweigen	'be silent.INF'	121

The sound underlying [g]~[ʝ] alternations is /ɣ/, which surfaces as [g] in coda position by (14) and as [ʝ] in a word-internal onset (by Velar Fronting-1).[3]

(14) g-Formation-3:

$$\begin{bmatrix} -\text{SON} \\ +\text{CONT} \\ -\text{FORTIS} \\ \text{DORSAL} \end{bmatrix} \rightarrow [-\text{cont}] \,/\, \_\_\, \mathrm{C}_0\,]_\sigma$$

[3]The reason /g/ cannot be the underlier in (13) is that the rule of spirantization required to convert that sound to a fricative would incorrectly affect /g/ in words like [vɑigə] 'wake-INF' (=⟦wɑⁱgə⟧.) It is clear from the original source that the occurrence of [ɣ] and [ʝ] in postvocalic position is more involved than what is implied here; I refrain from providing details because that discussion would detract from the velar vs. palatal contrasts, which are the main concern in the present chapter.

Palatal [ʝ] (<WGmc ⁺[ɣ]) – but never [ɣ] – surfaces after a front vowel (in 15a) or coronal sonorant consonant (in 15b).

(15) Wissenbach [ʝ] (from /ɣ/):

a.	blḗjə	[plɛːʝə]	pflegen	'care for.INF'	76
	rējəl	[reːʝəl]	Regel	'rule'	77
	ēj	[eːʝ]	Egge	'harrow'	120
b.	foljə	[folʝə]	folgen	'follow.INF'	81

As indicated above, the underlying dorsal fricative in words like the ones in (15) is analyzed as velar (/ɣ/).

The occurrence of palatal fricatives after back vowels is the consequence of a phonemic split triggered by Vowel Retraction (=2). In (16) I provide seven representative examples (from 4a, 5a, 6, 7a, and 8a). Consider first the items in the first four columns. It is shown here that the velars and palatals in those words derived from an earlier stage in which the fricatives in question were allophones (=Stage 2). The most significant example involves the /x/ in [blɑːç] 'pale', which surfaced as [ç] at Stage 2 because it was preceded by the front vowel [ei]. When Vowel Retraction restructured underlying representations (e.g. /ei/ > /ɑː/) at Stage 3, contrasts between the newly created (opaque) phoneme /ç/ in words like [blɑːç] and the inherited phoneme /x/ in words like [ɑːx] 'also' emerged after back vowels such as [ɑː]. The example [blɑːç] therefore illustrates that the historical process eliminating front vowels (Vowel Retraction) counterbled Velar Fronting-1.

(16)

/ɑːx/	/bux/	/bix-ər/	/bleix/	/hɑxəl/	/dɑx/	/dɑix-ər/	
[ɑːx]	[bux]	[bixər]	[bleix]	[hɑxəl]	[dɑx]	[dɑixər]	Stage 1
/ɑːx/	/bux/	/bix-ər/	/bleix/	/hɑixəl/	/dɑx/	/dɑix-ər/	
[ɑːx]	[bux]	[biçər]	[bleiç]	[hɑiçəl]	[dɑx]	[dɑiçər]	Stage 2
/ɑːx/	/bux/	/bix-ər/	/blɑːç/	/hɑçəl/	/dɑx/	/dɑç-ər/	
[ɑːx]	[bux]	[biçər]	[blɑːç]	[hɑçəl]	[dɑx]	[dɑçər]	Stage 3
auch	*Buch*	*Bücher*	*bleich*	*Hachel*	*Dach*	*Dächer*	MoStGm
'also'	'book'	'books'	'pale'	'hatchel'	'roof'	'roofs'	

Phrased in terms of the listener-driven model described in §2.5, a speaker utters [bleiç] (from /bleix/) at Stage 2. The listener misperceives the diphthong as [ɑː] but correctly hears the palatal [ç]. This results in the new (Stage 3) pronunciation [blɑːç]. Most importantly, the listener concludes that the Stage 3 underlying representation contains a palatal (/blɑːç/) because that fricative contrasts with the corresponding velar ([x]) after the same vowel.

The same explanation for the occurrence of [ç] after a back vowel holds for the examples in (5b-e). The original front stem vowel in those items underwent Vowel Retraction to a back vowel ([ɑ ɔ ɔː]), but only after the original front stem vowel had created a palatal allophone. The reader is referred to R. D. Hall (1973), who discusses qualitative shifts among vowels in Hessian varieties.

It can be observed in (16) that the allophonic rule of Velar Fronting-1 at Stage 2 became a rule of neutralization at Stage 3. At that point the process neutralized the contrast between velar and palatal to the latter after front vowels in words like [biçər] (/bix-ər/) 'books'.

The example [hɑçəl] 'hatchel' in (16) is different from [blɑːç] 'pale' because its original stem vowel was back (cf. MHG [ɑ]). As indicated above, there is evidence that the original back vowel ([ɑ] /ɑ/) shifted to a diphthong ending in a front vowel ([ɑi] /ɑi/) and later restructured to a back vowel ([ɑ] /ɑ/) by Vowel Retraction. As discussed by Kroh (1915: 74), the change I dub Back Vowel Diphthongization (e.g. [ɑ] /ɑ/ > [ɑi] /ɑi/ for 'hatchel') occurred in the context before velar consonants (/x g k ŋ/), where it is retained as [ɑi] before velar noncontinuants ([g k ŋ]), e.g. [hɑiks] 'witch'; cf. OHG [hɑgzussɑ]. The restructuring of the new diphthong [ɑi](/ɑi/) to the monophthong [ɑ] (/ɑ/) by Vowel Retraction only occurred in the context before a palatal.[4] [hɑçəl] 'hatchel' and [dɑx] 'roof' illustrate that Back Vowel Diphthongization only affected a monophthong ([ɑ]) before [x] (/x/) if the latter sound was in an original open syllable (e.g. [dɑ.xər]). In a syllable closed by one consonant (e.g. [dɑx]), the monophthong failed to diphthongize and is retained as [ɑ].[5] As noted earlier in (7), the umlauted vowel in *-er* plurals in the CHes dialect of Wissenbach was [ɑi] before a velar. The second component of that diphthong was deleted at Stage 3 by Vowel Retraction, thereby creating a phonemic palatal.

From a formal point of view, the palatal in words like [blɑːç] 'pale', [hɑçəl] 'hatchel', and [dɑçər] 'roofs' arose just as palatal quasi-phonemes (Chapter 7): The feature [coronal] of the second component of the earlier diphthong ([ei] or [ɑi]) was simultaneously linked to the preceding palatal sound ([ç]). When those diphthongs were restructured to back monophthongs by Vowel Retraction, the feature [coronal] was not deleted, but instead remained anchored to the palatal, which had been phonemicized. Note that the underlying /x/ in the first three examples in (16) was inherited without change as /x/ at Stage 3.

[4] The back vowel in the singular forms in (7b,c) likewise shifted to a diphthong ending in [i] by Back Vowel Diphthongization, which was later deleted (Kroh 1915: 83, 92–93).

[5] In a syllable closed by two consonants the original vowel ([ɑ]) lowered and rounded to [ɔ], e.g. [mɔxt] 'power' (cf. MoStGm [mɑxt]).

I now consider four additional varieties of CHes which are structurally similar to Wissenbach. In all of those dialects the contrast alluded to arose via Vowel Retraction, as depicted in (2) and (16).

Friebertshäuser (1961) describes the dialect spoken in and around Weidenhausen (Footnote 7.1). That source lists twenty-seven monophthongs, but not all of those vocalic elements are phonemic in the same community. In Weidenhausen the two fricatives [x] (=⟦x⟧) and [ç] (=⟦χ⟧) are phonemic (as in 3) because they contrast after certain back vowels.[6]

As illustrated in (17), [x] occurs after back vowels that were also historically back. By contrast, the examples in (18) show that the opaque palatal [ç] surfaces after a back vowel ([ɑ ɔ]) that was historically front. The change from front vowel to back vowel was accomplished by Vowel Retraction; recall the parallel examples from Wissenbach in (5b,c,e). The [x] and [ç] in (17) and (18) derived historically from velar sounds (WGmc $^{+}$[k x ɣ]). Note that WGmc $^{+}$[ɣ] (/ɣ/) restructured to fortis [ɣ] (/x/), e.g. [ku:xəl] 'ball' and [bo:xə] 'bow'.

(17) Weidenhausen [x] (from /x/):

	kūxəl	[ku:xəl]	Kugel	'ball'	16
	dụx	[dʊx]	Tuch	'towel'	18
	bōxə	[bo:xə]	Bogen	'bow'	15
	pǫxt	[pɔxt]	Pacht	'lease'	15
	dɑx	[dɑx]	Dach	'roof'	11
	rẹ̄ɑx	[rɛ:ɑx]	Rauch	'smoke'	20

(18) Weidenhausen [ç] (from /ç/):

a.	dɑχ	[dɑç]	Teich	'pond'	18
	lɑχ	[lɑç]	Leiche	'body'	18
b.	ɑχ	[ɑç]	ich	'I'	14
	dɑχ	[dɑç]	dich	'you-ACC SG'	14
c.	lǫχdə	[lɔçtə]	Leuchte	'light'	21
	fǫχd	[fɔçt]	feucht	'damp'	21

[6] Weidenhausen also possesses the etymological palatal [ʝ] in word-initial position. The lenis velar [ɣ] is absent entirely. Palatal [ʝ] (<WGmc $^{+}$[ɣ]) surfaces after a coronal sonorant and before a vowel, but Friebertshäuser (1961: 24) also includes one example in which that sound occurs after a back vowel, i.e. [fʊʝəl] 'birds' (=⟦fụʝəl⟧). The velar stop [g] contrasts with palatal [ʝ] in postvocalic position, although many words exhibit alternations between [ʝ] and [g]. I leave open how to analyze that array of facts in a synchronic treatment.

The examples listed above are important because they show contrasts between [x] and [ç] after [ɔ] in [pɔxt] 'lease' vs. [fɔçt] 'damp' and after [ɑ] in [dɑx] 'roof' vs. [dɑç] 'pond'.[7]

Weidenhausen also contrasts [x] and [ç] (<WGmc +[k x] or +[ɣ]) after the diphthong [ɔːə], as in (19a) vs. (19b). Unlike the words in (18), the diphthong in (19) was etymologically back (cf. MHG [ɑ]). Recall from (16) that in the related variety spoken in Wissenbach, MHG [ɑ] (/ɑ/) underwent a shift to a diphthong ending in a front vowel ([ɑi] /ɑi/) which then monophthongized to [ɑ] (/ɑ/) before [ç]. I posit that there was a similar development in Weidenhausen; hence, the diphthong deriving from historical [ɑ] ended in a front vowel, which triggered Velar Fronting-1, thereby creating [ç]. Assuming that the diphthong in question was [ɔːi] (/ɔːi/), the change to [ɔːə] (/ɔːə/) in (19a) triggered the phonemicization of /ç/. The change from a diphthong ending in a front vowel to one ending in schwa is a specific example of Vowel Retraction.

(19) Weidenhausen [x] (from /x/) and [ç] (from /ç/)

a.	nǫəχd	[nɔːəçt]	Nacht	'night'	11
	gəmǫəχd	[gəmɔːəçt]	gemacht	'done-PART'	11
b.	mǫəxə	[mɔːəxə]	Magen	'stomach'	24
	grǫəxə	[grɔːəxə]	Kragen	'collar'	24

The examples in (19b) differ from the ones in (19a) in that the dorsal fricatives in the former examples derived from WGmc +[ɣ]. It is not clear why [x] and not [ç] occurs in (19b). One possibility is that when velar fronting was first phonologized the trigger was restricted to [+fortis] sounds. Given that restriction, [ɣ] surfaced in a word-internal onset even after front vowels. WGmc +[ɣ] was then restructured to [x] (/x/) at a later point. Since the details are not crucial for the present analysis, I do not discuss this issue.

The data in (20) exemplify [x]~[ç] alternations. Note that the stem vowel in the words as they were transcribed by Friebertshäuser in 1961 are back in both the singular and the plural but that the plural form has an (opaque) palatal fricative [ç]; recall the parallel examples from Wissenbach in (7).

(20) Weidenhausen [x]~[ç] alternations (from /x/ or /ç/):

[7] Friebertshäuser (1961: 63–64) notes that palatal [ç] occurs after the long low back vowel [ɑː], which derived historically from WGmc +[e] in closed syllables, e.g. [ʃlɑːçt] 'bad' (=⟦šlɑχd⟧; cf. MHG *sleht*). The [ç] in that type of example is clearly an underlying palatal (/ç/). I interpret that [ç] as a quasi-phoneme and not as a phonemic palatal because no example was found in the original source [x] surfaces after [ɑː].

a.	bu̜x	[bʊx]	Buch	‘book’	22
	bu̜χər	[bʊçər]	Bücher	‘books’	22
b.	šdro̜x	[ʃtrɔx]	Strauch	‘shrub’	34
	šdro̜χ	[ʃtrɔç]	Strauch, pl	‘shrubs’	34

I analyze the dorsal fricatives in (20) as either /x/ or /ç/, e.g. /ʃtrɔx/ ‘bush’ and /ʃtrɔç/ ‘bushes’ for (20b).

Many words exhibit [x]~[ç] alternations triggered by a stem vowel mutation. The examples in (21a) illustrate that the vowel mutation in question can be Umlaut, while the items in (21b) show that dialect-specific vowel changes could also trigger the occurrence of [x] after a back vowel that was etymologically front. [x ç] in these examples derived historically from a velar sound (WGmc $^{+}$[k]).

(21) Weidenhausen [x]~[ç] alternations (from /x/):

a.	flu̜xə	[flʊxə]	fluchen	‘curse.INF’	18
	fli̜χ	[flɪç]	Flüche	‘curses’	18
b.	šdi̜əx	[ʃtɪəx]	Stich	‘sting’	22
	šdi̜χ	[ʃtɪç]	Stiche	‘stings’	22

The underlying sound in the [x]~[ç] alternations in (21) is /x/, which fronts to [ç] after a front vowel by Velar Fronting-1.

As in Wissenbach, there is no contrast between [x] and [ç] after a coronal sonorant. The data in (22) illustrate that [ç] (but never [x]) occurs in that context. The front vowels in (22a) and the coronal sonorant consonants like [l] (in 22b) were historically front (coronal) sounds.

(22) Weidenhausen [ç] (from /x/):

a.	ri̜χə	[rɪçə]	riechen	‘smell.INF’	20
	dsēχə	[tseːçə]	Zeichen	‘sign’	19
	fe̜χdə	[fɛçtə]	fechten	‘fence.INF’	13
b.	mi̜lχ	[mɪlç]	Milch	‘milk’	14

I adopt underlying representations for words like the ones in (22) with /x/.

Bender (1938) describes a CHes variety spoken in and around Marburg, focusing in particular on the town of Ebsdorf (Footnote 7.1). The author lists twenty-six monophthongs (p. 14), but it is not clear how many of those sounds are phonemic in any one community. On the basis of the material in that source, it appears that Ebsdorf has the phonemic front and back vowels /i eː e ɛː ɛ/ and /u oː o ɔː ɔ ɑː ɑ/ respectively. Ebsdorf has the four dorsal fricatives [x ç ɣ ʝ]. [x] (=⟦x⟧) and [ç] (=⟦χ⟧) are phonemic because they contrast after certain back vowels, whereas [ɣ] and [ʝ] stand in an allophonic relationship:

(23)

/x/	/ç/	/ɣ/	
[x]	[ç]	[ɣ]	[ʝ]

The data in (24) exemplify the occurrence of [x] after a back vowel, while the examples in (25) reveal that the opaque palatal [ç] surfaces after the back vowel [ɑ]. [x ç] in (24) and (25) derive from an etymological velar sound (WGmc ⁺[k x]). Note that [x] and [ç] contrast after [ɑ], e.g. [bɑx] 'stream' vs. [tɑç] 'pond'. As in Wissenbach, Ebsdorf [ɑ] in examples like the ones in (25a) derived historically from a front vowel (cf. MHG [iː]). The original stem vowel in (25b) was back (cf. MHG [ɑ]), which underwent Back Vowel Diphthongization to [ɑi] and then Vowel Retraction to [ɑ] before [ç]; see the discussion in (16) involving the Wissenbach data in (6) and the parallel examples from Weidenhausen in (19). The vowel in (24) was etymologically back.

(24) Ebsdorf [x] (from /x/):

	bux	[bux]	Buch	'book'	24
	nōx	[noːx]	nach	'after'	23
	wox	[wox]	Woche	'week'	20
	nǫxt	[nɔːxt]	Nacht	'night'	16
	kǫxə	[kɔxə]	kochen	'cook.INF'	20
	bɑx	[bɑx]	Bach	'stream'	15

(25) Ebsdorf [ç] (from /ç/):

a.	glɑχ	[glɑç]	gleich	'soon'	24
	tɑχ	[tɑç]	Teich	'pond'	24
b.	hɑχəl	[hɑçəl]	Hechel	'hatchel'	17

As in the other varieties of CHes discussed above, the contrast between velar [x] (/x/) and palatal [ç] (/ç/) arose via a phonemic split triggered by Vowel Retraction (=2).[8]

[8] Palatal [ç] (<WGmc ⁺[k]) also occurs after a consonant in words like [hobç] 'hawk' (=⟦hobχ⟧). The palatal in that type of example was quasi-phonemicized (/ç/) when the original front vowel preceding it was syncopated (cf. MHG *habech, habich*). [ç] (<WGmc ⁺[x]) – but not [x] – also occurs in Ebsdorf after the back vowel [ɑː], which is the reflex of WGmc ⁺[e] in a closed syllable, e.g. [ʃlɑːçt] 'bad' (=⟦šlɑχt⟧). That palatal is a quasi-phoneme (/ç/), as in Weidenhausen.

A representative example illustrating [x]~[ç] (<WGmc ⁺[k x]) alternations triggered by an umlauted stem vowel is presented in (26). The underlying velar in that alternation surfaces as palatal by Velar Fronting-1. Morphemes containing a nonalternating palatal [ç] after coronal sonorants are listed in (27).

(26) Ebsdorf [x]~[ç] alternations (from /x/):

	dux	[dux]	Tuch	'towel'	24
	diχər	[diçər]	Tücher	'towels'	25

(27) Ebsdorf [ç] (from /x/):

a.	fliχt	[fliçt]	Pflicht	'duty'	19
	keχ	[keç]	Küche	'kitchen'	22
	ę̄χə	[ɛːçə]	Eiche	'oak tree'	32
	bęχər	[bɛçər]	Becher	'cup'	18
b.	melχ	[milç]	Milch	'milk'	19

The data in (28) illustrate the postsonorant distribution of [ɣ], which only occurs after a back vowel (in 28a) and [ʝ], which only surfaces after a coronal sonorant (in 28b,c). Both fricatives in question derive from an etymological velar (WGmc ⁺[ɣ]). The palatal in examples like these derives synchronically from /ɣ/ by Velar Fronting-1.

(28) Ebsdorf [ɣ] and [ʝ] (from /ɣ/):

a.	mǫɣə	[mɔːɣə]	Magen	'stomach'	33
	ɑɣə	[ɑːɣə]	Auge	'eye'	33
b.	sē̌jə	[seːʝə]	Säge	'saw'	33
	lęjə	[lɛʝə]	legen	'place.INF'	17
c.	mǫrjə	[mɔrʝə]	morgen	'tomorrow'	33

Note that Velar Fronting-1 has a different status depending on the trigger: For /x/ the rule functions as a neutralization, but for /ɣ/ it continues to be an allophonic process (as it was for /x/ at Stage 2).

Knauss (1906) describes the CHes variety spoken in the neighboring localities of Atzenhain and Grünberg (Footnote 7.1). Atzenhain/Grünberg possesses the front vowels /i eː e ɛ ɛː æ/ and the back vowels /u o ɔː ɑ/. Note the presence of the low front vowel [æ] (<WGmc ⁺[e]), which is absent in the CHes varieties discussed above. [x] (=⟦χ⟧) and [ç] (=⟦c⟧) are phonemic because they contrast after one of the phonemic back vowels ([ɑ]). The only lenis palatal fricative is [ʝ], which appears to have a distribution as in Weidenhausen (see Map 6).

In both Atzenhain and Grünberg [x] surfaces after a back vowel which is historically back (in 29), while the opaque palatal [ç] occurs after the back vowel [ɑ] which derived historically from a front vowel (cf. MHG [iː] in 30a). In Grünberg [ç] also occurs after [ɑː] (in 30b,c), whose progenitor was a diphthong whose both components were front. The changes affecting the original vowels in (30) are specific examples of Vowel Retraction. A sample [x]~[ç] alternation in which the stem vowel is back before both sounds is presented in (31). The fricatives ([x ç]) in (29–31) derived historically from a velar sound (WGmc +[k x]).

(29) Atzenhain/Grünberg [x] (from /x/):

buχ	[bux]	Buch	'book'	74
loχ	[lox]	Loch	'hole'	58
dɑχ	[dɑx]	Dach	'roof'	28
ɑχ	[ɑːx]	auch	'also'	70

(30) Atzenhain/Grünberg [ç] (from /ç/):

a.	bɑcd	[bɑçt]	Beichte	'confession'	57
	glɑc	[glɑç]	gleich	'same'	57
b.	blɑcə	[blɑːçə]	bleichen	'bleach.INF'	68
c.	rɑcn̥	[rɑːçn̩]	räuchern	'smoke.INF'	68

(31) Grünberg [x]~[ç] alternations (from /x/ and /ç/):

rɑχ	[rɑːx]	Rauch	'smoke'	70
rɑcn̥	[rɑːçn̩]	räuchern	'smoke.INF'	71

[x]~[ç] (<WGmc +[k x]) alternations triggered by the quality of the preceding vowel (via Umlaut) are presented in (32). The palatal in that type of example derives from the velar by the rule of fronting posited below.

(32) Atzenhain/Grünberg [x]~[ç] alternations (from /x/):

a.	buχ	[bux]	Buch	'book'	74
	bicər	[biçər]	Bücher	'books'	74
b.	nǫχd	[nɔːxt]	Nacht	'night'	32
	nęcd	[nɛçt]	Nächte	'nights'	41
c.	dɑχ	[dɑx]	Dach	'roof'	28
	dęcr̥	[dɛçr̩]	Däche	'roofs'	45

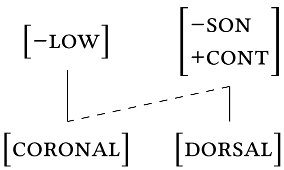
As indicated in (33), the distribution of dorsal fricatives after front vowels is not the same as in the other CHes varieties mentioned above: [x] surfaces after the low front vowel [æ] (in 33a); see R. D. Hall (1973: 18) for discussion. By contrast, [ç] occurs after a nonlow front vowel (in 33b) or a coronal sonorant consonant (in 33c). Velar [x] never surfaces after nonlow front vowels, nor does palatal [ç] occur after [æ]. The dorsal fricatives in all of these examples derive from velars (WGmc $^{+}$[k x]).

(33) Atzenhain/Grünberg [x] and [ç] (from /x/):

a.	blæχ	[blæx]	Blech	'tin'	47
b.	gəsicd	[gəsiçt]	Gesicht	'face'	53
	brēc	[bre:ç]	brechen	'break.INF'	52
	šdec	[ʃdeç]	Stiche	'stings'	54
	šlḗcd	[ʃlɛ:çt]	schlecht	'bad'	48
	ɑic	[ɑiç]	ich	'I'	56
c.	melc	[melç]	Milch	'milk'	56

The data in (33) require the set of triggers for fronting to consist of nonlow front vowels. The rule required is Velar Fronting-2 (§3.4), which is reproduced in (34):

(34) Velar Fronting-2:



In a short (four page) summary of his dissertation of 1921, Siemon (1922) describes the CHes variety of Langenselbold, near Hanau (Footnote 7.1). The data in that source indicate that Langenselbold possesses front vowels (/i iː eː e ɛ ɛː/), back vowels (/u uː o oː ɔ ɔː ɑ ɑː/) and several diphthongs. Enough crucial examples in Siemon (1922) are provided to conclude that this CHes variety has both velar [x] (=⟦χ⟧) and palatal [ç] (=⟦c⟧). Those fricatives are both phonemic (=1a) because they contrast after one of the phonemic back vowels ([ɑː]). (The historical lenis fricatives WGmc $^{+}$[ɣ] and $^{+}$[ʝ] have merged with their fortis counterparts).

The data from Langenselbold presented in (35)-(38) are very similar to the examples in the neighboring CHes varieties discussed earlier. The words in (35) indicate that [x] surfaces after back vowels that are historically back. The two examples in (36) reveal that [ç] surfaces after a back vowel ([ɑː]) which was etymologically a diphthong ending in a front vowel. Note that [x] and [ç] contrast in the context after [ɑː], e.g. [ɑːx] 'also' vs. [vɑːç] 'soft'; hence, they are both phonemic, as indicated in the headings for the two datasets. The [x ç] in all of the examples presented below derived historically from a velar sound (WGmc ⁺[k x]).

(35) Langenselbold [x] (from /x/):

hūx	[huːx]	hoch	'high'	140
wuxə	[vuxə]	Woche	'week'	142
nǭxd	[nɔːxt]	Nacht	'night'	140
kǫxə	[kɔxə]	kochen	'cook.INF'	142
bɑx	[bɑx]	Bach	'stream'	139
ɑx	[ɑːx]	auch	'also'	140
flǫuxə	[flɔuxə]	fluchen	'curse.INF'	140

(36) Langenselbold [ç] (/from /ç/):

glɑχə	[glɑːçə]	gleichen	'resemble.INF'	140
wɑχ	[vɑːç]	weich	'soft'	140

The additional data reveal that there are morphemes with [x]~[ç] alternations (in 37) as well as nonalternating words in which [ç] surfaces after a front vowel or coronal sonorant consonant (in 38).

(37) Langenselbold [x]~[ç] alternations (/from /x/):

a.	fuxəl	[fuxəl]	Vogel	'bird'	140
b.	fiχəl	[fiçəl]	Vögel	'birds'	139

(38) Langenselbold [ç] (/from /x/):

a.	liχd	[liçt]	Licht	'light'	139
	knę̄χd	[knɛːçt]	Knecht	'vassal'	141
	šbręχə	[ʃprɛçə]	sprechen	'speak.INF'	142
	ɑiχ	[ɑiç]	ich	'I'	142
b.	kęʳχ	[kɛrç]	Kirche	'church'	139

As indicated in the headings for (37) and (38), the dorsal fricatives in these words is underlyingly /x/. That sound is realized as [ç] after a coronal sonorant by Velar Fronting-1.

The five places discussed above are very different from other CHes varieties in which velar and palatal fricatives do not contrast. For example, in Naunheim (Leidolf 1891; Footnote 7.1) [x] and [ç] stand in complementary distribution: [x]

only surfaces after a back vowel, e.g. [tsʊxt] 'breeding' (=⟦tsŭcd⟧) and [ç] after a front vowel, e.g. [dɪçt] 'tight' (=⟦dĭçd⟧). The reason [ç] does not surface after back vowels is that Vowel Retraction did not occur, cf. Naunheim [blɑiç] 'pale' (=⟦blā^{j}ç⟧; recall 5a), [loiçtə] 'light' (=⟦loiçdə⟧; recall 5e). Examples like [ʃlæçt] 'bad' (=⟦šlæçd⟧) indicate that the triggers for Velar Fronting-1 in Naunheim subsume all front vowels and not simply nonlow front vowels as in Atzenhain/Grünberg. A CHes dialect in closer proximity to the four velar vs. palatal contrasting varieties discussed above is the one spoken in Schlierbach (Schaefer 1907; Footnote 7.1). As in Naunheim, no Vowel Retraction occurred and hence there are no contrasts between velars and palatals, which stand in complementary distribution.

9.3 Rhenish Franconian

Two varieties of RFr are discussed below which exhibit Contrast Type B (=1a) in postsonorant position between [x] (/x/) and [ç] (/ç/). Since the sources have data very similar to the ones presented in §9.2 for CHes I do not discuss the RFr material in as much detail as the CHes varieties.

Freiling (1929) describes the variety of Zell im Mümlingtal in the Oldenwald (Footnote 5.3). Zell im Mümlingtal has a number of phonemic front vowels (/iː i eː e ɛː ɛ/), phonemic back vowels (/u uː oː o ɔː ɔ ɑː ɑ/) as well as several diphthongs. A representative dataset is presented in (39). The words in (39a) indicate that [x] surfaces after a back vowel that is etymologically back. The items presented in (39b) show that [ç] surfaces after the one back vowel [ɑː], which derived historically from a diphthong ending in a front vowel (cf. MHG [ei]). As in the CHes varieties discussed above, [x] and [ç] contrast in the context after the back vowel [ɑː]; hence, [x] (=⟦x⟧) and [ç] (=⟦χ⟧) are both phonemic and illustrate Contrast Type B. (As in Langenselbold, historical [ɣ] and [ʝ] have merged with their fortis counterparts). The items listed in (39c) show that there are [x]~[ç] alternations, and the data in (39d) reveal that [ç] – but never [x] – surfaces after a front segment. The dorsal fricatives in (38c,d) is underlyingly /x/ and is realized as [ç] after any front segment by Velar Fronting-1.

(39) Zell im Mümlingtal [x] and [ç]:

a.	wux	[vux]	Woche	'week'	75
	koxə	[koxə]	kochen	'cook.INF'	75
	nǫxd	[nɔxt]	Nacht	'night'	10
	lɑxə	[lɑxə]	lachen	'laugh.INF'	75

	rɑx	[rɑːx]	Rauch	'smoke'	35
	ɑxə	[ɑːxə]	Augen	'eyes'	35
b.	ɑχ	[ɑːç]	Eiche	'oak tree'	33
	wɑχ	[vɑːç]	weich	'soft'	33
c.	nǫxd	[nɔxt]	Nacht	'night'	10
	nę̄χd	[nɛçt]	Nächte	'nights'	12
d.	siχəʳ	[siçər]	sicher	'certainly'	74
	beχ	[beç]	Bach	'stream'	74
	gnę̄χd	[knɛːçt]	Knecht	'vassal'	16

Seibt (1930) describes the dialect of Heppenheim (Footnote 5.3). He lists nineteen monophthongs, but it is probably not the case that all of those sounds are phonemic. On the basis of that source, Heppenheim has phonemic front vowels (/iː i eː e ɛː ɛ æ/) and back vowels (/u uː oː o ɔː ɔ ɑː ɑ/) as well as several diphthongs. Heppenheim has the four dorsal fricatives [x ç ɣ ʝ]. [x] (=⟦x⟧) and [ç] (=⟦χ⟧) are phonemic because they contrast after certain back vowels, whereas [ɣ] and [ʝ] stand in complementary distribution; see (23).

The examples in (40a) reveal that [x] surfaces after back vowels that are etymologically back. [ç] surfaces after the one back vowel [ɑː] (in 40b), which derives historically from a diphthong ending in a front vowel. Since [x] and [ç] contrast after [ɑː] those two fricatives are phonemic. A representative example of a morpheme exhibiting [x]~[ç] alternations is given in (40c), and the words in (40d,e) show that the palatal but never the velar occurs after coronal sonorants. The final set of examples indicates that the lenis dorsal fricative [ɣ] (/ɣ/) surfaces after a front vowel (in 40f) or back vowel (in 40g).

(40) Heppenheim [x] (from /x/):

a.	bux	[bux]	Buch	'book'	30
	doxdəʳ	[doxtər]	Tochter	'daughter'	58
	ǫxd	[ɔxt]	acht	'eight'	58
	lɑxə	[lɑxə]	lachen	'laugh.INF'	58
	rɑx	[rɑːx]	Rauch	'smoke'	33
b.	sɑχə	[sɑːçə]	seichen	'piss.INF'	32
c.	nǭxd	[nɔːxt]	Nacht	'night'	68
	nę̄χd	[nɛːçt]	Nächte	'nights'	68
d.	khiχ	[kʰiç]	Küche	'kitchen'	30
	šlę̄χd	[ʃlɛːçt]	schlecht	'bad'	58
	fęχdə	[fɛçtə]	fechten	'fence.INF'	19
	rɑiχ	[rɑiç]	reich	'rich'	57

e.	fe̜rχdə	[fɛrçtə]	fürchten	'fear.INF'	45
f.	fē̜ɣə	[fɛːɣə]	fegen	'sweep.INF'	56
	šdɑiɣə	[ʃtɑiɣə]	steigen	'climb.INF'	56
g.	foɣl	[foɣl̩]	Vogel	'bird'	56
	nɑɣl	[nɑɣl̩]	Nagel	'nail'	56

The dorsal fricatives in (40c-e) are underlyingly /x/, which surfaces as [ç] after a coronal sonorant. The target segment must be specified as [+fortis] to ensure that only /x/ but not /ɣ/ is affected; hence, the rule for Heppenheim is Velar Fronting-4 (§4.3, §7.2)

9.4 Discussion

I discuss first the status of Contrast Type A and Contrast Type C systems attested in word-initial position (Chapter 8) for postsonorant position (§9.4.1) and second the question of whether or not the quasi-phonemicization of palatals is a necessary prerequisite for the phonemicization of palatals (§9.4.2).

9.4.1 Velar vs. palatal contrasts

All of the case studies discussed in this chapter have in common that they exemplify Contrast Type B (=1), which involves a palatal vs. velar contrast after one or more back vowel, but in the context of front vowels, only palatals surface. The present survey of German dialects has failed to uncover Contrast Type A or Contrast Type C (as described in Chapter 8) in postsonorant position, as in (41):

(41) Nonoccurring contrasts:

a. Contrast Type A:

[...iç...]	[...ɑç...]	[...iʝ...]	[...ɑʝ...]
[...ix...]	[...ɑx...]	[...iɣ...]	[...ɑɣ...]

b. Contrast Type C:

[...iç...]		[...iʝ...]	
[...ix...]	[...ɑx...]	[...iɣ...]	[...ɑɣ...]

In (41a) velars and palatals contrast after back vowels and front vowels, but in (41b) that contrast occurs only after front vowels but not after back vowels, where only the velar surfaces. I speculate here on the absence of the two systems depicted in (41).

Consider first (41a). There is more than one way in which a system involving a contrast between [ɣ] and [ʝ] after front and back vowels might arise. One way would require the following developments: (a) Etymological ⁺[ɣ] is inherited without change as [ɣ] after a back vowel, (b) etymological ⁺[ɣ] surfaces as [ʝ] after a back vowel derived from an earlier front vowel (by Vowel Retraction), and (c) WGmc ⁺[j] undergoes Glide Hardening in a word-internal onset after front vowels and back vowels. Recall from §9.2 that (a) and (b) are well-attested, e.g. in Wissenbach examples (11) and (12). That point aside, it is difficult to find examples for (c) because the etymological palatal glide was typically either deleted in postvocalic position, or it merged together with the preceding vowel to form a diphthong (Appendix F).

Consider now (41b). Recall from Chapter 8 that the mirror-image of (41b) involving [x] and [ç] in word-initial position is attested in a single village. In that place the velar vs. palatal contrast before a front vowel arose when r-Deletion eliminated the /r/ between a word-initial velar (/x/) and a front vowel. A deletion process affecting a postvocalic /r/ is attested in German dialects (e.g. in the RFr varieties discussed by Karch 1981; see §9.4.2). If velar fronting applies after front vowels but not after coronal consonants, and if /r/ were elided between any vowel (including front vowels) and velar sounds (including /x/), then the surface sequence of front vowel plus velar fricative ([ix] /ix/) would be created, e.g. a sequence like [ɪrx] (/ɪrx/) > [ɪx] (/ɪx/) in a word like *Kirche* (cf. Erdmannsweiler [kʰerç] /kʰerx/ from §3.2). Although the deletion of a postvocalic /r/ is not at all uncommon in German dialects the scenario just described would be difficult to document because only a small number of German dialects restrict velar fronting to the context after front vowels but not after coronal consonants like /r/ (see Chapter 12).

9.4.2 Relationship between phonemic palatals and palatal quasi-phonemes

The dialects discussed in Chapter 7 all have in common that a Stage 2 allophonic rule of velar fronting developed into a Stage 3 system with a palatal quasi-phoneme, but none of those dialects also possess phonemic palatals. The question is whether or not the quasi-phonemicization of palatals is a necessary prerequisite for the phonemicization of palatals; see (42a). Recall from §7.4.4 that this is the historical progression predicted by Kiparsky (2015). Alternatively, quasi-phonemicization and phonemicization might not be directly related, in which case a system involving allophony could develop into either one, as depicted in (42b).

(42) a. Allophony
↓
Quasi-phonemicization
↓
Phonemicization

b. Allophony
↙ ↘
Quasi-phonemicization Phonemicization

Most of the dialects discussed in this book with phonemic palatals also possess palatal quasi-phonemes, a system that can be accommodated with either (42a) or (42b). This is true for word-initial position in Eilsdorf (§8.3) and Dingelstedt am Huy (§8.4) as well as in the LGm varieties discussed below in Chapter 11.

I tentatively suggest that (42b) is the correct path. The reason (42a) cannot always be correct is that there is at least one example of a dialect with phonemic palatals but no palatal quasi-phonemes, namely the CHes dialect of Wissenbach (§9.2). One could speculate that Wissenbach once had a palatal quasi-phoneme before the velar vs. palatal contrasts emerged and that the original palatal quasi-phoneme fell together with the new contrastive palatals, thereby obscuring its historical origin. That scenario is a plausible one, and for that reason I ultimately leave open whether or not (42b) is the correct path for further research.

9.5 Areal distribution of postsonorant phonemic palatals

The case studies discussed in this chapter have in common that they contrast velars and palatals in postsonorant position. Sources documenting a contrast between /x/ and /ç/ are listed in Table 9.1.

Table 9.1 includes the seven CHes/RFr case studies discussed above as well as works not discussed earlier, which I comment on below. All of these places are listed on the maps for the respective dialect areas.

In their discussion of the inflectional morphology of verbs in Großen-Buseck, Wagner & Horn (1900) list examples like [ʃlɑçə] 'creep.INF' (cf. MoStGm *schleichen*) vs. [ʃtrɑçə] 'paint.INF' (cf. MoStGm *streichen*) with [ç] after the back vowel [ɑ] that derived historically from [ɑi]. Significantly, they also include items like [mɑxə] 'do.INF' (cf. MoStGm *machen*), where [x] occurs after [ɑ]. In a short excerpt from his dissertation, Schwing (1921) describes the historical phonology of

Table 9.1: Varieties of German with phonemic palatals (< WGmc +[k x]) in postsonorant position

Place	Dialect	Source
Großen-Buseck	CHes	Wagner & Horn (1900)
Atzenhain/Grünberg	CHes	Knauss (1906)
Wissenbach	CHes	Kroh (1915)
Selters bei Weilburg	CHes	Schwing (1921)
Langenselbold	CHes	Siemon (1922)
Wetterfeld	CHes	Schudt (1927)
Ebsdorf	CHes	Bender (1938)
Weidenhausen	CHes	Friebertshäuser (1961)
Mittelhessisch	CHes	Hasselberg (1979)
Ober-Flörsheim	RFr	Haster (1908)
Kaulbach	RFr	Christmann (1927)
Zell im Mümlingtal	RFr	Freiling (1929)
Heppenheim	RFr	Seibt (1930)
Area south of Mainz	RFr	Karch (1981)
Merzig	MFr	Fuchs (1903)
Dudenrode	Thrn	Guentherodt (1982)
Neuendorf	Eph	Schütze (1953)

the (CHes) aea around Selters bei Weilburg, noting the existence of contrasts between [x] and [ç] in words like [ɑːxə] 'eye' (cf. MoStGm *Auge*) vs. [tsɑːçələ] 'draw.INF' (cf. MoStGm *zeichnen*). The same type of contrast can be found in the material presented in Schudt (1927) for Wetterfeld, e.g. [ɑːx] 'also' (cf. MoStGm *auch*) v. [blɑːç] 'pale' (cf. MoStGm *bleich*), as well as in Christmann (1927) for Kaulbach, e.g. [rɑːxə] 'smoke.INF' (cf. MoStGm *rauchen*) v. [rɑːçə] 'reach.INF' (cf. MoStGm *reichen*) and Haster (1908) for Ober-Flörsheim, e.g. [rɑːxən] 'smoke.INF' v. [rɑːçən] 'reach.INF'. Merzig (Fuchs 1903) is geographically further removed from the others varieties listed in Table 9.1. Like the dialects listed above, historical [ei] is now realized as [ɑː] in Merzig; hence, there are contrastive pairs like [rɑːxən] 'smoke.INF' (cf. MoStGm *rauchen*) vs. [blɑːçən] 'bleach.INF' (cf. MoStGm *bleichen*). Similar examples involving a contrast between [x] and [ç] after the same back vowel can be found in the data in Hasselberg (1979), which were drawn from a number of places in Central Hesse. Karch (1981) is the description of the sound structure of five towns just south of Mainz, namely Wackernheim, Nackenheim, Alzey, Wallertheim, and Bechtheim. Karch (1981: 23) writes that /x/ and

/ç/ must be separate phonemes because they contrast after certain back vowels, e.g. [dɑx] 'roof' (cf. MoStGm *Dach*) vs. [dɑç] 'through' (cf. MoStGm *durch*). In contrast to all of the other studies listed in Table 9.1, phonemic /ç/ arose when a postsonorant rhotic deleted, cf. [dɑç] 'through' < [dʊrç]. The original source for the one ECGm dialect listed above (Guentherodt 1982) provides phonetic transcriptions for three speakers from Dudenrode and observes (p. 46) that [ç] and [x] contrast after the one low vowel (short and long), e.g. [ʃlaxt-] 'slaughter-VB STEM' (cf. MoStGm *schlachten*) vs. [ʃlaçt] 'bad' (cf. MoStGm *schlecht*). The status of velars and palatals in word-initial position in the one LGm variety (Eph) cited above (Neuendorf) was discussed in §8.5. The original source for that dialect (Schütze 1953) gives examples of contrasts between velar [x] and palatal [ç] in the context after [ɑː], e.g. [dɑːç] 'dough' (cf. MoStGm *Teig*) vs. [plɑːx] 'plow' (cf. MoStGm *Pflug*).

The places listed above with a palatal vs. velar contrast can be complemented with data from linguistic atlases. Consider the following two examples:

Map 4 of ThürDA depicts the various realizations of the word *Egge* 'harrow' in the state of Thuringia. An examination of that map reveals that there is a small part of west Thuringia with a palatal fricative ([ç] or [ʝ]) after the back vowel [ɑː] – a point that is stressed with an exclamation point after the back vowel plus palatal sequence in the commentary to Map 4 in Volume 1 (p. 32). Since [x] surfaces after back vowels (including [ɑː]) throughout the area, those places with words containing [ɑː ç] illustrate a contrast between [ç] and [x].

A second example for the palatal vs. velar contrast comes from SchlSA, which depicts an area far removed spatially from the places listed in Table 9.1, namely the former province of Silesia (Schlesien). Map 26 from that source depicts the realizations of the word *leuchten* 'glow.INF'. The initial vowel in that word (< MHG [yː]) is either a front monophthong or a diphthong ending in [i] (see 43a) or a back monophthong (see 43b). Significantly, the fricative in (43b) is always realized as palatal [ç]. As illustrated on my Footnote 5.2, velar fronting after coronal sonorants (or a subset thereof) is the norm throughout Silesia (§12.3.5).[9]

(43) a. [lɛçd̥n̩], [luiçd̥n̩], [lɔiçd̥n̩]
b. [laçd̥n̩], [lɔçd̥n̩]

[9] The symbol [a] in SchlSA is categorized as central (p. 5). On p. 13 of the introduction, G. Bellmann comments on how remarkable ('[b]emerkenswert') it is that [ç] occurs after a back vowel in items like the ones in (43b). The realization [lɔçd̥n̩] was attested just to the east of Grunlich and the variant [lɔçd̥a] about 70km southwest of Gleiwitz (see my Footnote 5.2). By contrast, the markers indicating [laçd̥n̩] are much more numerous, being interspersed with the transparent realizations in (43a) in a broad area in between Görlitz and Breslau.

Although the SchlSA does not provide a map with [x] after back vowels, it is clear from all of the descriptions of Sln dialects I have consulted (Appendix C, Table C.19) that words of that structure are common; hence, the places in Silesia where (43b) were once attested can be safely assumed to be areas where [ç] and [x] contrasted after back vowels.

Most of the places listed in Table 9.1 are CHes varieties situated within the same general vicinity in the German state of Hesse, although a few of the RFr/MFr outliers and the Sln varieties in (43b) indicate that contrasts between [x] and [ç] are not restricted to that specific area. No other areas with phonemic /x/ and /ç/ in German-speaking countries are known to the present writer.[10]

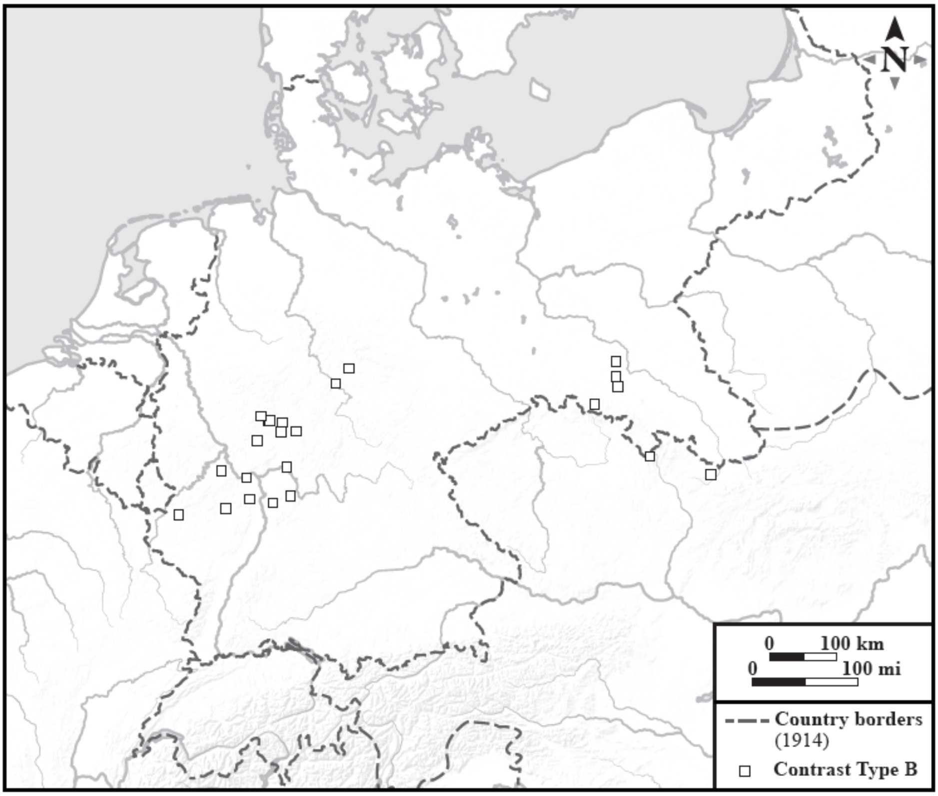
Footnote 9.1 depicted all of the places listed in Table 9.1 as well as those Sln varieties with the pronunciations listed in (43b).

The contrast between [x] and [ç] in the context after back vowels is also documented in dialect dictionaries. A case in point is SHesWb for the south part of Hesse, which provides phonetic transcriptions with separate symbols for velars (⟦x⟧=[x]) and palatals (⟦χ⟧=[ç]). In SHesWb, multiple phonetic transcriptions corresponding to specific places in the broad region are provided for any given word. The regular pattern whereby [x] occurs after back vowels and [ç] after front vowels and liquids is clear from many common words, e.g. *Loch* 'hole', *Licht* 'light', *Dolch* 'dagger'. The important point is that words like the ones discussed earlier which contain an etymological front vowel now realized as back are transcribed with the symbol for the palatal fricative, e.g. *bleich* 'pale' (⟦blɑχ⟧), *Deich* 'dike' (⟦dɑχ⟧).

9.6 Conclusion

The case CHes/RFr studies discussed in this chapter have in common that velars and the corresponding palatals contrast in the context after certain back vowels. That type of contrast was the result of a phonemic split triggered by Vowel Retraction, after which a new contrast arose between velar and palatal after a back

[10] Contrasts between /x/ ([x]) and /ç/ ([ç]) are also not uncommon in various German-language islands I do not consider in this book. One example is the ELGm (EPr) variety of Plautdietsch; see Siemens (2012: 71), who lists the minimal pair ⟦acht⟧ 'eight' ([ɑxt]) vs. ⟦ajcht⟧ 'genuine' ([ɑçt]). A second example is the CGm variety of Burgberg spoken in Romania (Maurer 1959). According to that source, ⟦x⟧ (=[x]) and ⟦χ⟧ (=[ç]) contrast in the context after ⟦ā⟧ (=[ɑː]), e.g. ⟦šprāx⟧ 'language' vs. ⟦āχt⟧ 'eight'. Palatal [ç] arose in words like ⟦āχt⟧ because the original short low vowel (⁺⟦a⟧) fronted to ⟦ē⟧ and then retracted and lowered to ⟦ā⟧; see Maurer (1959: 12). Thus, the front vowel ⟦ē⟧ triggered the change from /x/ to [ç], which was phonemicized to /ç/ when ⟦ē⟧ shifted to ⟦ā⟧. The ⟦ā⟧ in words like ⟦šprāx⟧ 'language' did not undergo these vowel shifts because it was originally long (⁺⟦ā⟧).



Map 9.1: Areal distribution of postsonorant velar vs. palatal contrasts. High German (Central German) and Low German (Eastphalian) varieties with a contrast between a fortis velar [x] (/x/) and a fortis palatal [ç] (/ç/) (< WGmc $^{+}$[k] or $^{+}$[x]) after a back vowel are indicated with white squares.

vowel. The consequence is that the original rule of velar fronting ceased to operate as an allophonic operation and became a rule of neutralization which only applied in the context after coronal sonorants (or a subset thereof).

In Chapter 10 I consider a set of German dialects that is similar to the ones discussed in the present chapter in the sense that phonemic palatals now stand in contrast with the corresponding velars after back vowels. In contrast to the systems examined above, the ones I investigate in the following chapter have in common that the phonemic palatals are realized in the phonetics as sibilants (i.e. as alveolopalatal [ɕ]).

10 Phonemicization of palatals (part 3)

10.1 Introduction

A common pattern characterized by many CGm varieties involves the historical merger of the original palatal (nonsibilant) allophone [ç] (/x/), together with the inherited postalveolar (sibilant) fricative [ʃ] (/ʃ/) to a new sibilant fricative, namely alveolopalatal [ɕ] (/ɕ/). That change (ALVEOLOPALATALIZATION) is depicted provisionally in (1).[1] Not shown here is the retention of the original velar allophone [x] (/x/), which surfaces in the context after back vowels.

(1) Alveolopalatalization (first version):

[ç] [ʃ]

[ɕ]

As a consequence of alveolopalatalization (MoStGm) words like [ɪç] 'I', [fɪʃ] 'fish', and [frɔʃ] 'frog' are realized as [ɪɕ], [fɪɕ], and [frɔɕ] respectively, but words with historical [x] after a back vowel retain that velar, e.g. [lɔx] 'hole'. Since [ɕ] and [x] contrast in the context after a back vowel (cf. [frɔɕ] vs. [lɔx]), alveolopalatalization involves the phonemicization of /ɕ/. Significantly, the development in (1) did not result in the loss of velar fronting, which remains active as a rule of neutralization relating words with alternations triggered by back vs. front vowels, e.g. [lɔx] (/lɔx/) 'hole' vs. [lœɕɐ] (/lœx-ɐ/) 'holes'.

Alveolopalatalization has been studied extensively in the German dialect literature where it has been demonstrated that the change has been ongoing in

[1]Alveolopalatalization is referred to in much of the recent literature cited below as "Koronalisierung" ['coronalization']. I eschew the latter term because [ʃ], [ɕ] and [ç] are all [coronal]. Much has been written on the phonetics of the sibilants referred to here, both from the cross-linguistic perspective (e.g. Ladefoged & Maddieson 1996) and from the perspective of German dialects (e.g. Herrgen 1986, Gilles 1999). To simplify, alveolopalatal [ɕ] is usually described in the dialect literature as being articulated with unrounded (spread) lips, while postalveolar [ʃ] is pronounced with lip rounding and protrusion. I discuss the way in which phonological representations mirror those articulations below.

central Germany from the late nineteenth century to the present day. Some of the works on this topic include Mitzka (1972), Robinson (2001), Hall (2014a), and Féry (2017), although the most comprehensive treatment is undoubtedly Herrgen (1986).

In the system described above there is a contrast between velar ([x]) and alveolopalatal ([ɕ]) after certain back vowels (e.g. [frɔɕ] 'frog' vs. [lɔx] 'hole'), but in the context after front vowels only [ɕ] occurs (e.g. [ɪɕ] 'I', [lœɕɐ] 'holes'). That system is therefore akin to the one for the postsonorant velar vs. palatal contrasts classified in Chapter 9 as Contrast Type B, which can be extended to alveolopalatalizing dialects as in (2), where [i] and [ɑ] are cover symbols for front vowels and back vowels respectively.

(2) Contrast Type B:

[...iɕ...]	[...ɑɕ...]
	[...ɑx...]

The occurrence of the front sound [ɕ] in the context after a back vowel in (2) does not involve overapplication opacity because it was not the product of velar fronting. For example, the [ɕ] in [frɔɕ] 'frog' derived historically from the coronal sibilant [ʃ] and not from a velar (cf. MHG *vrosch*).

I argue that the changes in (1) involved an intermediate stage not depicted above:

(3)

/x/	/ʃ/	>	/x/		/ʃ/	>	/x/		/ʃ/	>	/x/	/ɕ/
[x]	[ʃ]		[x]	[ç]	[ʃ]		[x]	[ɕ]	[ʃ]		[x]	[ɕ]

In (3) the original velar is realized as velar after any kind of sound, and later the palatal (nonsibilant) allophone ([ç]) develops. The intermediate stage absent in (1) is one in which the earlier palatal allophone ([ç]) is realized as alveolopalatal [ɕ], which exists side by side with the inherited sibilant [ʃ]. In the final stage of (3) the earlier allophone [ɕ] and the inherited fricative [ʃ] merge to [ɕ]. At that point [x] and [ɕ] contrast only in the context after a back vowel, as in (2). The final stage of (3) illustrates another instantiation of a phonemic split triggered by merger (Chapter 8).

Evidence for the final two stages in (3) comes from German dialects. Some dialects reveal the Contrast Type B system in the final stage in (3), while others represent the pre-Contrast Type B system where [ɕ] is still an allophone of [x] (/x/) which exists side by side with [ʃ].

In §10.2 I provide a more in-depth discussion of the historical stages depicted in (3). In the remainder of the chapter I discuss Contrast Type B dialects (§10.3) as well as dialects in which [ɕ] is still an allophone of [x] (§10.4). In §10.5 I discuss the areal distribution of alveolopalatalizing varieties. §10.6 considers three topics in greater detail, namely the origin and spread of alveolopalatalization, the realization of the lenis fricative [ʝ] as an alveolopalatal sibilant, and the way in which certain underlying representations are restructured in the course of alveolopalatalization. In §10.7 I conclude.

10.2 Alveolopalatalization deconstructed

It is argued below that alveolopalatalization consists of the stages depicted in (3), which are made more explicit in (4). Stage A corresponds to what has been referred to in earlier chapters as Stage 2 (Figure 2.2). Reference is made at Stage A to the distinctive features for [ʃ] (/ʃ/) described in §2.2.2. Recall from that section that the category "sibilant" is not relevant for the phonology of German dialects under investigation in the present book and that phonological representations for sounds like /s/ and /ʃ/ consequently lack the nondistinctive feature [±strident]. The realization of sounds like /s/ and /ʃ/ as sibilants at the level of Speech is accomplished with phonetic implementation discussed in greater detail below.

(4) Historical stages for alveolopalatalization:

Stage A: Velar ([x]) and palatal ([ç]) are allophones related by velar fronting (from /x/). Phonemic [ʃ] (/ʃ/) is also present; that segment is phonologically a simplex coronal distinct from [s] (/s/) by either [±anterior] or [±high]. Phonetic implementation ensures that all simplex coronal fricatives (but crucially not the complex segment [ç]) are realized at the level of Speech as sibilants.

Stage B: Velar fronting continues to be active. It has the same form as the eponymous process at Stage A and therefore creates a [coronal, dorsal] fricative. [ʃ] (/ʃ/) is also present, which is reanalyzed phonologically as a complex [coronal, labial] segment. [coronal, labial] and [coronal, dorsal] fricatives are interpreted by phonetic implementation at the level of Speech as the sibilants [ʃ] and [ɕ] respectively.

Stage C: Phonemic [ʃ] (/ʃ/) undergoes a change to a complex segment ([coronal, dorsal]), thereby merging with the Stage B [coronal, dorsal] which itself was the product of velar fronting. That complex fricative is interpreted in phonetic implementation as the alveolopalatal sibilant [ɕ]. Velar fronting remains active as a neutralization rule capturing alternations between velar [x] and its fronted variant.

A simplification of the progression from Stage A to Stage C is given in (5). In the final column I list the dialects discussed below representing Stages B and C. In the remainder of this chapter I discuss first Stage C dialects because the descriptions for those varieties are more detailed (and impressionistically more common) than the ones for Stage B.

(5) Alveolopalatalization (final version):

[ç]	[ʃ]	Stage A (many dialects)
[ɕ]	[ʃ]	Stage B (Cologne, Frankfurt am Main/Montabaur)
[ɕ]		Stage C (Schlebusch, Lxm, Leipzig)

The palatal fricative [ç] undergoing alveolopalatalization can have more than one synchronic (and diachronic) source. As described above, Stage A [ç] can derive synchronically from /x/. What is not depicted in (5) is that the original [ç] that undergoes alveolopalatalization can also be the coda realization of lenis /ɣ/ after a front segment, e.g. Stage B/C /iɣ/⟶|ix|⟶[iɕ]. In dialects like those, /ɣ/ undergoes velar fronting after a front segment in a word-internal onset, surfacing as nonsibilant [ʝ] but not as the lenis alveolopalatal fricative [ʑ].

Velar fronting at Stage B/C necessitates the same change as in other dialects, namely one in which the feature [coronal] from a front segment spreads to [dorsal] sound, thereby creating a complex corono-dorsal segment. However, velar fronting does not create alveolopalatal [ɕ] directly; instead, the [coronal, dorsal] sound produced by velar fronting is interpreted as alveolopalatal by the phonetic implementation made explicit below.

An analogy can be made involving the rhotic consonant /r/. That segment is defined phonologically with a particular feature complex (e.g. [+consonantal, +sonorant, +continuant, coronal]), but those features tell us nothing about whether or not /r/ is realized in Speech as a trill or approximant (or something else). The feature complex [+consonantal, +sonorant, +continuant, coronal] is the phonological representation for /r/, but rules of phonetic implementation specify whether or not that segment is articulated as a trill (in one language, dialect, idiolect) or approximant (in another language, dialect, idiolect). Likewise the features [coronal, dorsal] for a fortis fricative say nothing about whether or not that segment is a sibilant ([ɕ]) or a nonsibilant ([ç]). That kind of fine-grained distinction is captured in the phonetics and not in the phonology.

There are a number of different ways to express the place contrast involving /s/, /ʃ/, and /ɕ/ According to one – alluded to briefly in §2.2.2 – /s/ and /ʃ/ (e.g. in MoStGm) are distinguished with either [±anterior] or [±high]. My analysis adopts the proposal made in some of the recent work on alveolopalatalization referred to above that lip rounding (recall Map 1) is phonologically distinctive for /ʃ/ in alveolopalatalizing dialects; hence, /ʃ/ is analyzed as [coronal, labial], /s/ is [coronal] without a [labial] component, and /ɕ/ is [coronal, dorsal]. One advantage of that treatment (not discussed below) is that it expresses the connection between alveolopalatalization and the unrounding of front rounded vowels (Hall 2014a). A second advantage is that the complex segment analysis of /ʃ/ simplifies the rules of phonetic implementation referred to above. As indicated below, phonetic implementation specifying sibilancy for one or more coronal fricative differs slightly according to the historical stage. I only list phonetic symbols for fortis fricatives here.

(6) Phonetic Implementation (Stage A):
   a. Fortis complex fricatives ([coronal, dorsal]) are interpreted as nonsibilants ([ç]).
   b. Simplex [coronal] fricatives are interpreted as sibilants ([s ʃ]).

(7) Phonetic Implementation (Stage B):
   a. Fortis complex fricatives are interpreted as sibilants ([coronal, labial] as [ʃ], [coronal, dorsal] as [ɕ]).
   b. Simplex [coronal] fricatives are interpreted as sibilants ([s]).

(8) Phonetic Implementation (Stage C):
   a. Fortis complex fricatives ([coronal, dorsal]) are interpreted as sibilants ([ɕ]).
   b. Simplex [coronal] fricatives are interpreted as sibilants ([s]).

Significantly, (6–8) refer to whether or not the phonological structures are simplex coronals or if they have a complex place structure. The important point to observe is that there were two changes involving (6–8). First, the requirement that complex fricatives surface as nonsibilants (=6a) changed to one specifying those sounds as sibilants (=7b). Second, the phonological representation of /ʃ/ changes from a simplex coronal at Stage A and a complex sound at Stage B.

10.3 Stage C dialects

10.3.1 Ripuarian (part 1)

Bubner (1935) describes the Rpn dialect spoken in Schlebusch (Leverkusen) in the German state of North Rhine-Westphalia (Nordrhein-Westfalen; Footnote 5.1), which has the phonemic front vowels /iː y yː e eː ɛ ɛː ø øː œ œː/ and the phonemic back vowels /u uː o oː ɔ ɔː ɑ ɑː ə/. Three diphthongs end in a front vowel (/ɑi ei øy/) and one ends in a back vowel (/ou/).

As in many other varieties of Rpn, Schlebusch has the three dorsal fricatives [x ɣ ʝ], (=⟦x ɣ j⟧) but no fortis palatal [ç]. In addition to [s z] (=⟦s z⟧), the dialect has a third sibilant fricative (=⟦š⟧), which Bubner describes (p. 6) as an alveolar-cerebral fricative ('alveolarer-zerebraler Reibelaut'). Since no further details are given, it is not possible to determine with certainty whether or not that sound corresponds to [ʃ] or [ɕ]. On the basis of phonological patterning I argue that ⟦š⟧ is alveolopalatal [ɕ] and not postalveolar [ʃ]. Further support that ⟦š⟧ represents [ɕ] is that other Stage C dialects are attested in which the output of that change is [ɕ], but no Stage C dialect to my knowledge is attested in which the output is [ʃ].

Schlebusch has the palatal nonsibilant lenis fricative [ʝ] – but no fortis counterpart ([ç]) – and the coronal (alveolopalatal) sibilant fricative [ɕ], but no lenis counterpart ([ʑ]). The phonemic fricatives in question and their allophones are illustrated for word-initial and postsonorant position in (9). Not depicted here is /g/, which contrasts with the fricatives listed in (9).

(9) a.

/ɕ/	/ʝ/
[ɕ]	[ʝ]

b.

/x/	/ɕ/	/ɣ/	
[x]	[ɕ]	[ɣ]	[ʝ]

The two velars [x] (/x/) and [ɣ] (/ɣ/) differ in terms of a laryngeal dimension. As implied by the phonetic symbols, [ʝ] and [ɕ] represent two distinct places of articulation from the point of view of phonetics. Bubner (1935: 6) therefore describes the place of articulation for [ʝ] (=⟦j⟧) as "palatal", which is different from the "alveolar-cerebral" category for [ɕ] (=⟦š⟧). In (10) I list the four fricatives in (9) from the point of view of phonetics; hence, each of the four columns reflect a separate place of articulation. For comparison, I also include [s] and [z], which are uncontroversially underlying segments.

(10) Coronal and dorsal fricatives (arranged according to phonetics):

fortis	[s]	[ɕ]		[x]
lenis	[z]		[ʝ]	[ɣ]

From the point of view of phonology, fortis [ɕ] (/ɕ/) and lenis [ʝ] (/ʝ/) are paired together just as other fortis vs. lenis pairs, namely [s] (/s/) and [z] (/z/); [x] (/x/) and [ɣ] (/ɣ/). Alternations between [x] and [ɕ] described below are likewise juxtaposed the same way alternations involving [ɣ] and [ʝ] are. The sibilant [ɕ] therefore occupies the slot other dialects fill with the nonsibilant [ç]. The analysis described here is depicted in (11).

(11) Coronal and dorsal fricatives represented phonologically:

[+fortis]	[s] (/s/)	[ɕ] (/ɕ/)	[x] (/x/)
[−fortis]	[z] (/z/)	[ʝ] (/ʝ/)	[ɣ] (/ɣ/)

I demonstrate below that the three pairs in (11) are alike featurally: /s z/ are simplex [coronal], /x ɣ/ simplex [dorsal], and /ɕ ʝ/ complex ([coronal, dorsal]).

In word-initial position [ɕ] surfaces before any type of vowel or before a coronal consonant (in 12a). The alveolopalatal in such examples derives from historical coronal sounds (cf. MHG *schūm*, MHG *slōz*). Palatal [ʝ] occurs word-initially before any vowel (in 12b). [ʝ] in examples like those derives from a historical palatal (WGmc $^{+}$[j]) or velar (WGmc $^{+}$[ɣ]). The fronting of an original velar before any kind of segment (as in Schlebusch) is investigated in Chapter 13.

(12) Schlebusch [ɕ] (from /ɕ/) and [ʝ] (from /ʝ/):

a.	šum	[ɕum]	Schaum	‘foam’	78
	šlǫs	[ɕlɔs]	Schloss	‘lock’	78
b.	jęl	[ʝɛl]	gelb	‘yellow’	72
	jǫ	[ʝɔː]	ja	‘yes’	88

The following data illustrate that [x] surfaces after back vowels (=13) and [ɕ] after front vowels (=14a) or back vowels (=14b). The [x] in (13) derived historically from a velar (WGmc $^{+}$[k] or $^{+}$[x]) and the [ɕ] in (14) from coronal [ʃ] (cf. MHG *zwischen, visch, droschen, vrosch*).

(13) Schlebusch [x] (from /x/):

bux	[bux]	Bauch	‘stomach’	65
lǫx	[lɔx]	Loch	‘hole’	65
bō:x	[boːx]	Buch	‘book’	65
hǫ:x	[hɔːx]	Haken	‘hook’	65
wɑx	[βɑːx]	wach	‘awake’	65
bɑx	[bɑːx]	Bach	‘stream’	65

(14) Schlebusch [ç] (from /ç/):

a.	krīšə	[kri:çə]	weinen	'cry.INF'	79
	tøšə	[tøçə]	zwischen	'between'	78
	veš	[veç]	Fisch	'fish'	78
	fleš	[flɛç]	Flasche	'bottle'	78
	vlēš	[vle:ç]	Fleisch	'meat'	78
b.	rūšə	[ru:çə]	rauschen	'rustle.INF'	79
	drošə	[droçə]	droschen	'threshed-PRET'	110
	vrǫš	[vrɔç]	Frosch	'frog'	21

Significantly, [x] and [ç] contrast after a back vowel, e.g. [vrɔç] 'frog' vs. [lɔx] 'hole', but after a front vowel only [ç] occurs (=2).

The absence of [x] after a front vowel is also reflected in the regular replacement of [x] with [ç] after a front vowel in morphophonemic alternations (see 15). As indicated here, [x] after a back vowel corresponds to [ç] after a stem vowel mutation. The material presented in the original source suggests that there are no exceptions to the alternating pattern in (15), e.g. a stem with a back vowel plus [x] in which the [x] surfaces without change as [x] and not as [ç] after the alternant with a front vowel. The dorsal fricatives in words like the ones in (15) derived historically from a fortis velar (WGmc ⁺[k] or ⁺[x]).

(15) Schlebusch [x]-[ç] Alternations (from /x/):

a.	ruxə	[ruxə]	riechen	'smell.INF'	35
	ryš	[ryç]	riecht	'smells-3SG'	35
b.	lǫx	[lɔx]	Loch	'hole'	96
	lø̄šə	[lø:çə]	Löcher	'holes'	96
c.	šprō:xə	[ʃpro:xə]	sprachen	'spoke-PRET'	112
	šprešə	[ʃprɛçə]	sprechen	'speak.INF'	112

The alternating examples in (15) are captured synchronically with an underlying /x/ which undergoes the version of velar fronting posited below. The reason /ç/ cannot be taken as basic with a rule retracting that sound to [x] after a back vowel is that there are a number of morphemes containing a nonalternating [ç], as in (14b). Additional examples are provided in (16). Note that the stem vowels in (16) set display the same kind of vowel alternations as in (15). Were /ç/ the sound underlying the alternations in (15), then the rule retracting that sound to [x] after a back vowel would incorrectly apply to some of the examples in (16).

(16) Schlebusch nonalternating [ç] (from /ç/):

a.	drę̄šə	[drɛɕə]	dreschen	'thresh.INF'	110
	drošə	[droɕə]	droschen	'threshed-PRET'	110
b.	vrǫš	[vrɔɕ]	Frosch	'frog'	21
	vrøš	[vrøɕ]	Frösche	'frogs'	22
c.	wūəš	[βu:əɕ]	Wurst	'sausage'	26
	wȳəš	[βy:əɕ]	Würste	'sausages'	26

The [ɕ] in (16) derives synchronically from /ɕ/, but the diachronic source for that sound was [ʃ].

The items listed in (17) contain a surface [ɕ] deriving etymologically from a fortis velar sound (WGmc ⁺[k]) in the context after a front vowel. No examples were found in the original source in which [ɕ] occurs after a coronal sonorant consonant.

(17) Schlebusch nonalternating [ɕ] (from /x/):

eš	[eɕ]	ich	'I'	65
zēš	[ze:ɕ]	kurze Sense	'short scythe'	65
bręšə	[brɛɕə]	brechen	'break.INF'	65
jøšə	[ɟøɕə]	jucken	'itch.INF'	65

As indicated above, the [ɕ] in (17) – in contrast to the examples in (15) – does not alternate with [x]. As a Contrast Type B dialect, Schlebusch does not contrast [x] and [ɕ] after front vowels; hence, I analyze the underlying representation in words like the ones in (17) with a velar (/x/), which is simply inherited from pre-Schlebusch (Stage B in 4). Note that there are two types of words with [ɕ] after a front vowel: Those in which [ɕ] is underlyingly /ɕ/ (in 16) and those in which [ɕ] derives from /x/ (in 17). A question I discuss in §10.6.3 is how speakers acquiring the Schlebusch system who are not knowledgeable about etymology are able to determine the correct underlying representation.

Velar [ɣ] surfaces in a word-internal onset only after a full back vowel (in 18a), while palatal [ʝ] is found in a word-internal onset only after a front vowel (in 18b). The items in (18c) indicate that [ʝ] can also occur in a word-internal onset after a schwa if that schwa is preceded by a coronal consonant. I analyze the [ʝ] in (18b,c) as a realization of /ɣ/. The [ɣ ʝ] in these examples derives historically from the lenis velar fricative (WGmc ⁺[ɣ]).

(18) Schlebusch [ɣ] and [ʝ] (from /ɣ/):

a.	ō:ɣə	[o:ɣə]	Augen	'eyes'	73
	zɑ:ɣə	[zɑ:ɣə]	sagen	'say.INF'	73

b.	bē:jə	[be:ɟə]	biegen	'bend.INF'	73
	zę̄jə	[zɛ:ɟə]	sägen	'saw.INF'	73
c.	o·rəjəl	[o·rəɟəl]	Orgel	'organ'	73
	he·ləjə	[he·ləɟə]	Heiligen	'saints'	73
	zɑ:nəjə	[zɑ:nəɟə]	sandiger	'sandy-INFL'	73

I argue that the pre-[ɟ] schwa in (18c) is epenthetic and that it acquires [coronal] from the segment to its left (/r l n/). That fronted schwa then spreads [coronal] to /ɣ/, thereby creating a palatal (recall §5.4), e.g. /o·rɣəl/ ⟶ |o·rəɣəl| ⟶ |o·rə̣ɣəl| ⟶ [o·rə̣ɟəl]. In contrast to the varieties discussed in §5.4, the rule fronting schwa is triggered by all coronal sonorants, while schwa epenthesis applies between a coronal sonorant and a noncoronal consonant (/ɣ/) that can be in a word-internal onset. I do not indicate the fronted schwa in the phonetic representations in (18c) and in similar examples presented below because my transcriptions are broad and not narrow.

Postsonorant /ɣ/ (<WGmc $^+$[ɣ] /ɣ/) participates in alternations involving laryngeal and place features like the ones in (19). In coda position, /ɣ/ undergoes Final Fortition to [x], as in the second example in (19a,b). If /ɣ/ is preceded by a front vowel, it is realized as [ɟ] in a word-internal onset (as in the first example in 19b-e) and as [ç] in the coda (as in the final example in 19c-e). That palatals in (19e) result when [ə̣] spreads its [coronal] feature to /ɣ/.

(19) Schlebusch laryngeal and place alternations (from /ɣ/):

a.	zɑ:ɣə	[zɑ:ɣə]	sagen	'say.INF'	73
	zɑ:x	[zɑ:x]	sage	'say-1SG'	74
b.	bədrē:jə	[bədre:ɟə]	betrügen	'cheat.INF'	108
	bədrox	[bədrox]	betrog	'cheated-PRET'	108
c.	zę̄jə	[zɛ:ɟə]	sägen	'saw.INF'	73
	zę̄š	[zɛ:ç]	sägt	'saws-3SG'	74
d.	fle:jə	[fle:ɟə]	fliegen	'fly.INF'	73
	flyšt	[flyçt]	fliegt	'flies-3SG'	74
e.	zɑ:nəjə	[zɑ:nəɟə]	sandiger	'sandy-INFL'	73
	zɑ:nəš	[zɑ:nəç]	sandig	'sandy'	73

In sum, [ɣ] and [ɟ] do not contrast; hence, those two sounds derive synchronically from /ɣ/, as indicated in the heading for (19). Velar fronting thus not only must capture the relationship between [x] and [ç] in (15) but also the one between [ɣ] and [ɟ] in (18) and (19).

In (20) I provide representations for the four fricatives discussed above (/ç x ɣ ʝ/). I also include /s/ for comparison. The structures given here are the ones present at the underlying level and in the phonetic representation. Recall from (9) that [ʝ] is an allophone of /ɣ/ in postvocalic position, but that it is an underlying palatal in word-initial position.

(20) a. [s] /s/

$$\begin{array}{c} \begin{bmatrix} -\textsc{son} \\ +\textsc{cont} \\ +\textsc{fortis} \end{bmatrix} \\ | \\ [\textsc{coronal}] \end{array}$$

b. [ç] /ç/

$$\begin{array}{c} \begin{bmatrix} -\textsc{son} \\ +\textsc{cont} \\ +\textsc{fortis} \end{bmatrix} \\ \diagup \quad \diagdown \\ [\textsc{coronal}] \quad [\textsc{dorsal}] \end{array}$$

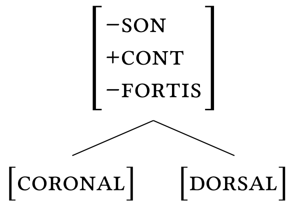
c. [x] /x/

$$\begin{array}{c} \begin{bmatrix} -\textsc{son} \\ +\textsc{cont} \\ +\textsc{fortis} \end{bmatrix} \\ | \\ [\textsc{dorsal}] \end{array}$$

d. [ɣ] /ɣ/

$$\begin{array}{c} \begin{bmatrix} -\textsc{son} \\ +\textsc{cont} \\ -\textsc{fortis} \end{bmatrix} \\ | \\ [\textsc{dorsal}] \end{array}$$

e. [ɟ] /ɟ/

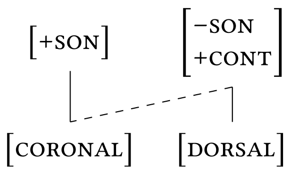


The most important structure here is the one for /ɕ/ in (20b), which I analyze as a complex corono-dorsal segment.

My claim that the place structure for [ɕ] and [ɟ] is the same derives support from the patterning of those two sounds after coronal sonorants. The examples in (19c-e) show that [ɟ] in a word-internal onset surfaces as [ɕ] in coda position. Since Final Fortition uncontroversially only alters a laryngeal feature, the implication is that [ɟ] and [ɕ] have the same place structure.

The fronting of velar (/x ɣ/) to a complex segment is accomplished with (21). The set of triggers for the /x/ target consists of front vowels. As noted above, no examples are attested for /x/ after a coronal sonorant consonant, although the data in (18c) illustrate that liquids indirectly trigger the fronting of /ɣ/ by spreading [coronal] to schwa, which feeds (21). Velar Fronting-1 – together with Final Fortition – also accounts for derived corono-dorsal sounds ([ɕ ɟ]) in (19).

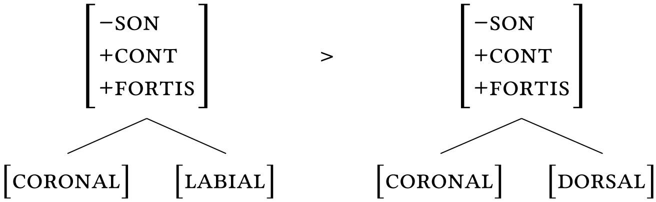
(21) Velar Fronting-1:



Velar Fronting-1 creates a derived corono-dorsal fricative which is realized at the level of Speech as the sibilant [ɕ] given the [+fortis] target segment /x/. The rule of phonetic implementation is stated in (8a) above. By contrast, the palatal ([ɟ]) created from the lenis velar fricative /ɣ/ is not interpreted as a sibilant (e.g. alveolopalatal [ʑ]) because (8a) only affects a [+fortis] sound. [ɟ] is also not affected by (8b), which targets simplex coronal fricatives.

Recall from (5) that there were two historical progenitors of alveolopalatal [ɕ], namely palatal [ç] and postalveolar [ʃ]. Since [ç] are [ɕ] are the same segment phonologically, the change from the former to the latter simply involves only the change in phonetic implementation rule (6a) to (7a)/(8a); see below for discussion. The shift from [ʃ] to [ɕ] necessitates a restructuring of the former to the latter. It was proposed earlier that Stage B (pre-Schlebusch) /ʃ/ was complex [coronal, labial]. The alveolopalatalization of that /ʃ/ therefore required (22), which entailed both the loss of [labial] as well as the addition of [dorsal]. The segments to the left and to the right of the wedge in (22) are interpreted as a sibilants by phonetic implementation (=7a/8a).

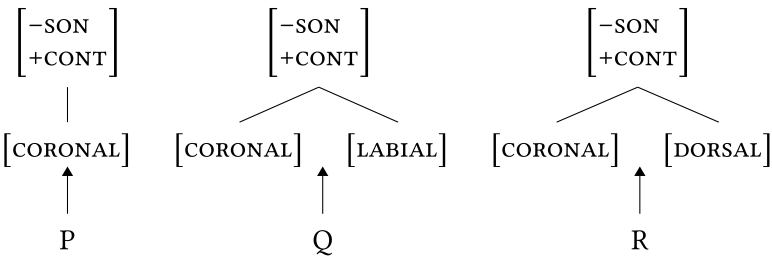
(22) Delabialization:



Delabialization was a historical merger because the representation to the right of the wedge is identical to the representation created by Velar Fronting-1 with the target segment /x/ or with the target segment /ɣ/ in coda position. As stated in (22) the change was context-free; hence any [ʃ] (/ʃ/) was restructured to alveolopalatal. However, some evidence discussed below in §10.4.2 indicates that there are alveolopalatalizing dialects in which Delabialization occurs only in a specific context.

In (24) I present six examples at the three historical stages in (4). The first two words represent a [x]~[ɕ] alternating pair in which the two fricatives derived historically from an earlier velar. The third and fourth items exemplify words with [ɣ] after a back vowel and [ʝ] after a front vowel. The fifth and sixth items are words with [ɕ] (<[ʃ]) which do not have an alternant with [x]. Stage C represents Schlebusch as it was described in 1935. Stage B (Pre-Schlebusch) is the point before Delabialization entered the language when Velar Fronting-1 was an allophonic rule for both /x/ and /ɣ/. I indicate in (23) with subscripts whether or not a fricative is simplex ([coronal] only) or complex (corono-labial) for [ʃ] or corono-dorsal (for [ɕ], [ʝ], or [ç]).

(23) Representations for simplex/complex segments:



(24)	/lɔx/	/lø:x-ə/	/o:ɣə/	/be:ɣ-ə/	/vrɔʃ$_P$/	/veʃ$_P$/	
	[lɔx]	[lø:ç$_R$ə]	[o:ɣə]	[be:ʝ$_R$ə]	[vrɔʃ$_P$]	[veʃ$_P$]	Stage A
	/lɔx/	/lø:x-ə/	/o:ɣə/	/be:ɣ-ə/	/vrɔʃ$_Q$/	/veʃ$_Q$/	
	[lɔx]	[lø:ɕ$_R$ə]	[o:ɣə]	[be:ʝ$_R$ə]	[vrɔʃ$_Q$]	[veʃ$_Q$]	Stage B
	/lɔx/	/lø:x-ə/	/o:ɣə/	/be:ɣ-ə/	/vrɔɕ$_R$/	/veɕ$_R$/	
	[lɔx]	[lø:ɕ$_R$ə]	[o:ɣə]	[be:ʝ$_R$ə]	[vrɔɕ$_R$]	[veɕ$_R$]	Stage C
	Loch	*Löcher*	*Augen*	*biegen*	*Frosch*	*Fisch*	MoStGm
	‘hole’	‘holes’	‘eyes’	‘bend.INF’	‘frog’	‘fish’	

At Stage A, [ʃ$_P$] and [ç$_R$] were distinct in the phonological component: The former was a simplex coronal, while [ç] was a complex corono-dorsal segment, as in all of the dialects discussed in the present work with that sound. At Stage A, Velar Fronting-1 affected both /x/ and /ɣ/. Since the output ([ç$_R$]/[ʝ$_R$]) was not an underlying segment, Velar Fronting-1 was an allophonic rule. [ʃ$_P$] is interpreted as a sibilant by (6b). At Stage B Velar Fronting-1 remains active as an allophonic rule in examples [be:ʝ$_R$ə] ‘bend.INF’ and [lø:ɕ$_R$ə] ‘holes’. [ɕ] in the latter word and [ʃ$_Q$] in words like [vrɔʃ$_Q$] ‘frog’ and [veʃ$_Q$] ‘fish’ are interpreted as sibilants by (7a). At Stage C, Delabialization altered the underlying representation of /ʃ$_Q$/ to /ɕ$_R$/ in [vrɔɕ$_R$] ‘frog’ and [veɕ$_R$] ‘fish’; hence that new sibilant merged with the [ɕ$_R$] allophone from Stage C in [lø:ɕ$_R$ə] ‘holes’. At this point (Schlebusch in 1935), Velar Fronting-1 remained in the grammar by applying as a neutralization to /x/ in alternating morphemes after a front vowel, e.g. in the second example in (24). Stage C [ɕ$_R$] is interpreted as a sibilant by (8a).

10.3.2 Moselle Franconian (Luxembourgish)

Gilles (1999) provides a detailed account of the phonetics and phonology of several varieties of Lxm (Footnote 5.3). In terms of German dialectology, Lxm is classified as a variety of MFr (Appendix A). Lxm has the phonemic front vowels /i iː e eː ɛ/ and the phonemic back vowels /u uː o oː ɑ ɑː ə/ as well as diphthongs ending in a back vowel, i.e. /iə uə ɑu ɑːu ou/ and diphthongs ending in a front vowel, i.e. /ei ɑi ɛːi/. In the following discussion I concentrate on the realization of fortis dorsal fricatives, i.e. the change from historical [ç ʃ] to alveolopalatal [ɕ]. I do not discuss lenis fricatives ([ʝ ɣ]) which can have different realizations depending on the dialect. See Gilles (1999) for discussion and Hall (2014a) for a phonological treatment.

Gilles (1999) notes that traditional sources for Lxm invariably transcribe the historical dorsal fricatives as [x] after a back vowel and elsewhere (e.g. after front vowels) as [ç] – as in MoStGm – and that these same sources likewise render etymological [ʃ] in modern Lxm as [ʃ]. An example of that type of source is LSA, which has [heiç] 'high' (Map 122) and [ʃɔn] 'already' (Map 121) throughout the central and southern parts of Luxembourg. According to the acoustic-phonetic investigation conducted by Gilles (1999), there is no evidence that the sound usually transcribed as [ç] is a palatal fricative. Instead, the author concludes that the historical palatal allophone of the phoneme /x/ has undergone an exceptionless, context-free shift to the sound he transcribes as [ɕ], which he calls "alveolar-palatal". The change referred to here appears to be ongoing and subject to some speaker-specific variation. Gilles writes (p. 238): "In keiner der Aufnahmen wurde ein Beleg mit *ç* transkribiert. Es findet sich ausschliesslich koronalisiertes *ɕ*. Auch in der [sic.] Aufnahmen der älteren Generation konnte kein *ç* gefunden werden". ['In none of the recordings was a token transcribed with *ç*. Only a coronalized *ɕ* was found. In the recordings of the older generation no instance of *ç* could be found either'.][2]

Examples illustrating the shift from palatal to alveolopalatal are presented in (25). Gilles does not give the phonetic representations for these words, but in his phonetic investigation of these examples he determined that the fricative corresponding to *ch* is alveolopalatal [ɕ] and not palatal [ç] or postalveolar [ʃ].[3] The data in (25) and below are drawn from speakers from Central, South, and East Lxm. By contrast, North Lxm (Nordösling) displays a very different pattern (§14.5).

(25) Alveolopalatalization of Lxm [ç] (/x/) to [ɕ] (/x/):

héich	hoch	'high'	239
Kichen	Küche	'kitchen'	239
Dicher	Tücher	'towels'	239
fiicht	feucht	'damp'	239

The examples in (25) are intended to show that all instances of the historical palatal fricative participated in the shift to alveolopalatal.

It is clear from the discussion in Gilles (1999) that the velar fricative [x] (/x/) is also present in the context after a back vowel, e.g. [nɑx] 'still'. As in all other

[2]Gilles's observation is corroborated by Newton (1993: 636), who writes that many speakers of Lxm have extreme difficulty in acquiring the ich-Laut, substituting instead an allophone approximating to the [ʃ], though realized without the labialization associated with MoStGm.

[3]Gilles's evidence (1999: 237, 239–241) is based on sonograms of the relevant fricatives. He concludes that [ɕ] is characterized by a higher tonality than [ʃ]. What is more, [ɕ] differs from [ç] in that the latter lacks a local maximum at the lowest frequency (see the spectrograms for [ʃ ɕ ç] in Gilles 1999: 237).

velar fronting dialects, alternations between [x] and [ɕ] are presumably present. For example, the third item in (25) has [ɕ] after the front vowel [i], but the corresponding fricative in the singular form (cf. MoStGm *Tuch*) has [x] because the preceding vowel is back.

The acoustic measurements made by Gilles were intended not only to determine whether or not the dorsal fricatives in (25) are alveolopalatal (which they are), but also to consider the nature of the historical postalveolar sibilant [ʃ]: Does this sound surface for the speakers of Lxm who have the alveolopalatal in (25) as [ʃ] or did the historical [ʃ] also undergo a change to [ɕ]? The results of Gilles's investigations showed the latter result. Examples of words with the etymological postalveolar are presented in (26). Gilles is clear that the fricative corresponding to *s* or *sch* in the examples in (26) is alveolopalatal [ɕ] and not postalveolar [ʃ]; hence, the historical postalveolar [ʃ] shifted to [ɕ] by Delabialization in (22).

(26) Alveolopalatalization of Lxm [ʃ] (/ʃ/) to [ɕ] (/ɕ/):

a.	Spigel	Spiegel	'mirror'	239
	stoen	stehen	'stand-INF'	239
	schléit	schlägt	'beats-3SG'	239
	schéin	schön	'beautiful'	239
b.	Dësch	Tisch	'table'	239
	Biischt	Bürste	'brush'	239
	éischten	erster	'first-MASC SG'	239
	Fräsch	Frosch	'frog'	239

From the synchronic perspective, Lxm exemplifies the Contrast Type B system depicted in (2) and possesses the representations for the fortis corono-dorsal fricatives presented in (20a-c). The [ɕ] in (25) derives synchronically from /x/ by Velar Fronting-1 and is interpreted as an alveolopalatal sibilant by (8a). The /ɕ/ in (26) is a [coronal, dorsal] fricative also targeted by (8a).

10.3.3 Upper Saxon

Große (1957) documents a series of sound changes which were occurring in the 1950s in colloquial speech in primarily urban varieties of USax (Footnote 7.2). He concentrates on the dialect as it is spoken in Leipzig, although Große observes that the facts are similar in other urban areas in the same region, e.g. Dresden and Chemnitz (formerly Karl-Marx-Stadt). Große does not give a list of the phonemic vowels, although it can be concluded from the data presented in that source that the dialect possesses the phonemic front (unrounded) vowels /i iː ɛ e eː æː/, the phonemic back vowels /u uː ɔ oː ɑ ɑː ə/, and the diphthongs /ɑe/ and /ɑo/.

Leipzig possesses one dorsal fricative ([x]) as well as the sibilant fricative Große transcribes as ⟦χ´⟧), which he describes as a (fortis) fricative acoustically between ('akustisch und schallphysiologisch zwischen'; p. 182) [ç] (=⟦χ⟧) and [ʃ] (=⟦š⟧). I transcribe ⟦χ´⟧ below as [ɕ], which Große (1957: 182) observes is articulated without lip rounding or lip protrusion, as opposed to [š] (Große 1957: 182). The dialect has no [ɣ] or [ʝ] because those historical fricatives (from WGmc +[ɣ]) merged with the corresponding fortis sounds. Contrasts between [x] and [ɕ] in postsonorant position require that those sounds be phonemic, as depicted in (27). The only dorsal fricative surfacing in word-initial position is [ɕ].

(27)

/x/	/ɕ/
|	|
[x]	[ɕ]

The postsonorant system in (27) exemplifies (2).

Examples illustrating the occurrence of [ɕ] are presented below in the context after a front vowel (in 28a) and after a coronal sonorant consonant (in 28b). Example (28c) reveals the occurrence of velar [x] after a back vowel. [ɕ] and [x] in these examples derived historically from a velar (WGmc +[x] or +[ɣ]).

(28) Leipzig [ɕ] (/ɕ/) and [x] (/x/):

a.	līχ´n	[liːɕn̩]	liegen	'lie-INF'	183
	niχ´	[niɕ]	nicht	'not'	183
	wɑ̄ χ´	[væːɕ]	Weg	'path'	183
b.	mōrχ´n	[moːrɕn̩]	morgen	'tomorrow'	183
	fẹlχ´n	[fɛlɕn̩]	Felgen	'wheel rims'	183
c.	mɑxə	[mɑxə]	mache	'do-1SG'	189

Since Große's concern is the change from [ç ʃ] to [ɕ], he does not discuss the distribution of [x], although it can be inferred that there are many morphemes displaying an alternation between [ɕ] and [x] depending on the quality of the preceding vowel. For example, the fricative [ɕ] in [lɛɕɔr] (=⟦lẹχ´ɔʳ⟧) 'holes' is [ɕ] after the front vowel, but the fricative in the singular noun *Loch* (cf. MoStGm [lɔx]) is presumably [x] because the preceding vowel is back. The [x] and [ɕ] in alternating pairs like that one derived historically from a velar (WGmc +[k]).

The examples in (29) illustrate the occurrence of [ɕ] after a front vowel (in 29a), back vowel (in 29b), noncoronal consonant (in 29c), or word-initially (in 29d). The [ɕ] in these examples derived from historical [ʃ] (/ʃ/) by Delabialization.

(29) Leipzig [ɕ] (/ɕ/):

a.	ȩŋliχ´	[ɛŋliɕ]	englisch	‘English’	183
b.	mɑχ´ə	[mɑɕə]	Masche	‘mesh’	189
c.	lȩbχ´	[lɛpɕ]	läppisch	‘petty’	183
d.	χ´leχ´d	[ɕleɕt]	schlecht	‘bad’	183

The examples in (28) and (29) together exemplify (2): [ɕ] surfaces after front vowels and back vowels, but [x] only occurs after back vowels. Note the minimal pair in (28c) vs. (29b).

In word-initial position [ɕ] surfaces before back vowels (in 30a) or front vowels (in 30b).

(30) Leipzig [ɕ] (/ɕ/) in word-initial position:

a.	χ´å^{r}	[ɕɑːɐ]	Jahr	‘year’	182
b.	χ´ȩds	[ɕɛts]	jetzt	‘now’	182

The [ɕ] in (30) is different from all of the other examples discussed above (including the ones in Schlebusch). The reason is that the historical source for [ɕ] was neither [ʃ] nor the palatal ([ç]) created by velar fronting. Instead, the initial sound in (30) is the etymological palatal (<WGmc $^{+}$[j] /j/), which underwent Glide Hardening to [ʝ] (/ʝ/). When the fortis vs. lenis contrast among fricatives was neutralized that distinctive laryngeal feature was subsequently lost.

Leipzig displays Stage C: The original palatal allophone of /x/ ([ç]) merged with the historical postalveolar sibilant [ʃ] (/ʃ/) to [ɕ] (/ʃ/). Große (1957: 183) emphasizes that this is a true merger on the basis of word pairs like the ones in (31), which are completely homophonous.

(31) Leipzig merger of /x/ ([ç]) and [ʃ] (/ʃ/) to [ɕ] (/ʃ/):

a.	diχ´	[diɕ]	Tisch	‘table’	183
	diχ´	[diɕ]	dich	‘you-ACC SG’	183
b.	lȩ^{r}χ´ɔ^{r}	[lɛɕɔr]	Löscher	‘extinguisher’	183
	lȩ^{r}χ´ɔ^{r}	[lɛɕɔr]	Löcher	‘holes’	183
c.	brȩχ´n	[brɛɕn̩]	brechen	‘break-INF’	183
	brȩχ´n	[brɛɕn̩]	breschen	‘breach-INF’	183
d.	lɑon^{i}χ´	[lɑoniɕ]	launig	‘witty’	183
	lɑon^{i}χ´	[lɑoniɕ]	launisch	‘moody’	183

From the formal perspective, Leipzig has two phonemic dorsal fricatives (/x ɕ/), which are represented as in (32).

(32)

a. /ɕ/

$\begin{bmatrix}-\text{SON}\\+\text{CONT}\end{bmatrix}$ dominating [CORONAL] and [DORSAL]

b. /x/

$\begin{bmatrix}-\text{SON}\\+\text{CONT}\end{bmatrix}$ dominating [DORSAL]

The alternations involving [x] and [ɕ] alluded to above are captured with underlying /x/, which shifts to a [coronal, dorsal] fricative |ç| by Velar Fronting-1. That feature complex is interpreted as [ɕ] by (8a).[4]

10.4 Stage B dialects

10.4.1 Ripuarian (part 2)

Heike (1964) offers a phonetic study grounded in traditional phonemic theory of the Stage B variety spoken in Cologne (Köln; Footnote 5.1). Note that Cologne is in the direct vicinity of Stage C Schlebusch (§10.3.1). Stage B is also implicit in the phonetic transcriptions provided in one of the dictionaries for Cologne German (KWb).[5]

The Cologne variety has large number of vocalic contrasts, which Heike analyzes as phonemic. Those segments consist of the front vowels /ɪ iː ʏ yː ɛ ɛː e eː œ œː ø øː/, the back vowels /ʊ uː ɔ ɔː o oː ɑ ɑː ə/, and the diphthongs /ei/, /øy/ and /ou/.[6] Heike observes that his dialect possesses a fricative reflex of historical [ç], which I interpret as [ɕ] (=⟦£ʿ⟧), as well as [ʃ] (=⟦ʃ⟧). The author describes ⟦£ʿ⟧ as '… a more or less strongly palatalized [ʃ] … and is articulated with unrounded lips'. ["… ist ein mehr oder weniger stark palatalisiertes [ʃ] … und wird mit entrundeten Lippen artikuliert", p. 45].

In postsonorant position the Cologne dialect has two phonemic velar fricatives: /x/ and /ɣ/. As indicated in the postsonorant system depicted in (33) the former is realized as [x] (=⟦x⟧) or [ɕ] (=⟦£ʿ⟧) and the latter as [ɣ] (=⟦ɣ⟧) or [ʝ] (=⟦ʝ⟧). [ɕ]

[4] The difference between (32) and the ones in (20b,c) for Schlebusch /ɕ x/ is the presence/absence of a distinctive laryngeal feature. As noted above, Schlebusch /x/ must be marked [+fortis] because it contrasts with [−fortis] /ɣ/. Since Leipzig fricatives do not display a laryngeal contrast, the two fricatives in that dialect lack specification for [±fortis]. The dialect possesses the rules of phonetic implementation in (8), although (8a) makes no reference to fortis fricatives.

[5] Two other sources for Stage B can be mentioned here: (i) Heike's (1970) phonetic study of Gleuel (Rpn; Footnote 5.1) and (ii) Post's (1987: 40) treatment of Gabsheim (RFr; Footnote 5.3).

[6] Heike's choice of symbols for the phonemic vowels and diphthongs is not exactly the same as my own. The differences between the two transcriptional systems are immaterial.

only occurs after a front vowel and [x] after a back vowel. The distribution of [ɣ] and [ʝ] is essentially the same as their fortis counterparts, although palatal [ʝ] (/ʝ/) also occurs word-initially (as in Schlebusch). It is demonstrated below that [ʃ] never contrasts with [ɕ].

(33)

/x/		/ʃ/	/ɣ/	
[x]	[ɕ]	[ʃ]	[ɣ]	[ʝ]

The system in (33) does not illustrate Contrast Type B in (2) because [ɕ] only occurs in the context after a front segment but not after a back vowel. Instead, Cologne exemplifies Stage B (in 5): [ɕ] (<[ç]) and [ʃ] (<[ʃ]) have not yet merged together and are still distinct.

Examples illustrating the occurrence of [ɕ] in the context after a front vowel are presented in (34a) and [x] after a back vowel in (34b). [ɕ] derives historically from a velar (WGmc +[k]). The [ɣ]~[ʝ] alternation in (34c) exemplifies the allophonic relationship involving /ɣ/, which is realized as [ɣ] after a back vowel and as [ʝ] after a front vowel. I analyze [ɕ] in (34a) as an allophone of /x/ and [ʝ] in (34c) as an allophone of /ɣ/. It is not possible to provide a complete set of data with [ɕ ʝ] after every phonemic front vowel because Heike does not give them. In contexts other than after a front vowel, [ʃ] occurs. A representative example for word-initial position is presented in (34d).[7]

(34) Cologne [ɕ] (/x/):

a.	ɪ£ʿ	[ɪɕ]	ich	'I'	45
	mɪ£ʿ	[mɪɕ]	mich	'me-ACC SG'	45
	œːntlɪ£ʿ	[œːntlɪɕ]	ordentlich	'orderly'	46
	jəzeː£ʿ	[ʝəzeːɕ]	Gesicht	'face'	46
	bøː£ʿɒ	[bøːɕɒ]	Bücher	'books'	46
	kʀeː£ʿpɔts	[kʀeːɕpɔts]	Griechenpforte	'(street name)'	112
b.	˙baːx	[bɑːx]	Bach	'stream'	90

[7] Heike (1964: 46) analyzes [g] (not depicted in 33) and [ɣ] as allophones. I do not discuss the patterning of [g] because that topic is peripheral. Most of Heike's examples are given in broad transcriptions in diagonal slashes representing phonemes (//). It is possible to reach conclusions on the distribution of the sounds in (33) on the basis of the author's remarks on allophones and on the basis of his narrow transcriptions enclosed in square brackets. In contrast to my treatment, Heike analyzes [ʃ] and [ɕ] as allophones of the same phoneme because they never contrast.

c.	fUɣəl	[fʊɣəl]	Vogel	‘bird’	50
	fʏjəl	[fʏʝəl]	Vögel	‘birds’	50
d.	ʃlai£ʿə	[ʃlaiɕə]	schleichen	‘creep-INF’	84

It is clear from the discussion in the original source that [ʃ] and [ɕ] never contrast. In Heike’s own words: “Oppositionen zwischen ʃ and £ʿ … existieren nicht …”. [‘Oppositions between ⟦ʃ⟧ and ⟦£ʿ⟧ … do not exist … ’]. For example, in the context after a front vowel, dialect speakers are unable to distinguish historical [ʃ] from [ɕ]. Recall from (31) that Leipzig has completely neutralized that contrast to [ɕ] in words like *Löscher* ‘extinguisher’ (cf. MoStGm [lœʃɐ]) vs. *Löcher* (cf. MoStGm [lœçɐ]) ‘holes’. Heike (1964: 46) observes that a similar generalization holds for Cologne, suggesting that Delabialization occurred – or is in the process of occurring – although only in the context after a front vowel. The complementary distribution of [ʃ] and [ɕ] is also clear in the narrow transcription of two texts read by native dialect speakers (pp. 131–132): [ɕ] (=⟦£ʿ⟧) surfaces after front vowels and [ʃ] elsewhere. The [ɕ] in those examples derives historically from a velar.[8]

From the formal perspective, the velars /x ɣ/ are represented as in (20c,d) and /ʃ/ as [coronal, labial]. Both /x ɣ/ serve as targets for Velar Fronting-1. In the case of target /ɣ/ Velar Fronting-1 creates |ʝ|, which surfaces as the nonsibilant [ʝ] in a word-internal onset, e.g. [fʏ.ʝəl] ‘birds’ from (34c). In the case of target /x/ the same process produces a complex corono-dorsal segment which is interpreted as the sibilant [ɕ] by (7a).

10.4.2 West Central German

Féry (2017) provides the results of a phonetic investigation involving alveolopalatalization in the speech of four speakers of WCGm dialects. Three of the four speakers are from Frankfurt am Main (Ches; Footnote 7.1) and the fourth is from Montabaur (MFr; Footnote 5.3). I do not provide a list of the phonemic vowels because they are not made explicit in the original source.

In Féry’s experiment the four speakers were asked to read sentences which included a selection of words containing MoStGm [ç] and [ʃ]. The result showed that there is a strong tendency to replace [ç] and [ʃ] with [ɕ], although there was not a complete neutralization indicative of Stage C dialects. Instead, the alveolopalatalization of [ç ʃ] to [ɕ] (also Féry’s symbols) led to a system in which both

[8]In contrast to Große (1957), Heike (1964) does not say explicitly that words like *Löscher* ‘extinguisher’ and *Löcher* ‘holes’ are homophonous, only that dialect speakers cannot distinguish the fricatives in question.

[ʃ] and [ɕ] are present. In contrast to all of the dialects discussed above the experiment also indicates the change from historical [ç] to [ʃ]. The results of the experiment are summarized in (35) and (36). Some of the items listed there are loanwords not discussed in the case studies in Chapter 3-Chapter 9. Féry does not provide full phonetic transcriptions for the German examples; the type of vowels and consonants referred to in the categories listed below can be inferred from the orthography. The realization of [ʃ] as [ɕ] in (35d) and of [ç] as [ʃ] in (36a,b) indicate a tendency and not Neogrammarian sound change. By contrast, the change from [ç] to [ɕ] in (36c) is a regular development. I have simplified the categories presented in Féry (2017) in (35) and (36), although those changes are immaterial. Féry (2017) notes that all of her speakers retain [x] in the context after a back vowel, e.g. *noch* 'still', *Kuchen* 'cake'.

(35) Reflexes of historical [ʃ] in Frankfurt am Main/Montabaur:
- a. [ʃ] in syllable-initial position before a back vowel or consonant:
  schon 'already', Schuhe 'shoes', Schnee 'snow'
- b. [ʃ] after a back vowel:
  rasch 'quick', Sushi 'sushi'
- c. [ʃ] after a (front or back) rounded vowel optionally separated by a consonant:
  Kusch 'shoo!', Bosch '(name)', Lösch 'delete-IMP SG', hübsch 'pretty'
- d. [ɕ] after a front unrounded vowel:
  Fisch 'fish', Tisch 'table', Fleisch 'meat'

(36) Reflexes of historical [ç]:
- a. [ʃ] in syllable-initial position before a front vowel:
  China 'China', Chemie 'chemistry'
- b. [ʃ] in coda position after a consonant:
  Dolch 'dagger', Mönch 'monk', durch 'through'
- c. [ɕ] after a front unrounded vowel optionally separated by a consonant:
  ich 'I', Blech 'tin', echt 'genuine', Milch 'milk'

The results of the experiment illustrate the merger of historical [ç ʃ] to [ɕ], but only in the context after a front unrounded vowel. In contrast to all of the other dialects discussed in this chapter, the data presented above also reveal the change from [ç] to [ʃ] in word-initial position before a front vowel or after a consonant.

From the synchronic perspective, the CHes/RFr speakers described above have the system of fortis fricatives as in (37). That system captures both postsonorant and word-initial position.

(37) /x/ /ʃ/

[x] [ç] [ʃ]

[x] and [ç] never contrast because the former only surfaces after a back vowel and the latter only after a front unrounded vowel; hence, (37) does not reflect (2). The [ç] in examples like the ones in (36c) is an allophone of /x/ which is realized as [coronal, dorsal] by Velar Fronting-1 and is interpreted as the sibilant [ç] by (7a).[9] Postalveolar /ʃ/ is clearly phonemic; note that [ʃ] and [x] contrast after a back vowel, e.g. *noch* 'still' with [x] vs. *Bosch* '(name)' with [ʃ]. In contrast to all of the other dialects discussed in this chapter, Delabialization as stated in (22) does not apply. Instead, that change is restricted to the context after front unrounded vowels. Thus, /ʃ/ is realized as [ç] in words like *Fisch* 'fish', but otherwise surfaces without change as [ʃ]. See Féry (2017) for an analysis of that change. From the historical perspective [ç] changed to [ʃ] in the contexts specified in (36a,b).

10.5 Areal distribution of alveolopalatalization

Table 1 provides a list of the alveolopalatalizing varieties of German discussed earlier, but I also include a number of others. All of these places are indicated on the maps for the dialect listed in the second column. Sępóno Krajeńskie (in the final box in that table) can be found on Footnote 11.2. Many of the sources listed here have been cited in the earlier literature on alveolopalatalization (in particular Herrgen 1986). I do not indicate which of the stages from §10.2 are attested in which variety because that information is not always clear from the source.[10] The sources given here are placed into four separate boxes corresponding to dialect area.

[9] Based on (35d) and (36c) it appears that [ç] is restricted in its occurrence to the context after a front unrounded vowel. No example was found in the original source in which [ç] surfaces after a rounded vowel (e.g. MoStGm *Löcher* 'holes'); hence, one cannot know for sure whether or not the set of triggers for velar fronting consists solely of front unrounded vowels.

[10] A few of the works listed in Table 10.1 make only passing reference to alveolopalatalization. For example, Freiling (1929: 8) observes that the articulation in question (constriction between the alveolar ridge and the hard palate) is typical for Bad König, which is about 4km from Zell am Mūmlingtal. (Freiling's data discussed in §9.3 from the latter place do not contain alveolopalatal segments.)

Table 10.1: Alveolopalatalizing varieties of HGm and LGm

Place	Dialect	Source
Mainz	RFr	Reis (1892)
Ludwigshafen am Rhein	RFr	Krell (1927)
Saarbrücken	RFr	Kuntze (1932), Steitz (1981)
Bad König	RFr	Freiling (1929)
Plankstadt	RFr	Treiber (1931)
Speyer	RFr	Waibel (1932)
Pfungstadt	RFr	Grund (1935)
Nußdorf	RFr	Bertram (1937)
Eberbach	RFr	Kilian (1951)
South Odenwald/Ried	RFr	Bauer (1957)
Darmstadt	RFr	Keller (1961)
Oftersheim	RFr	Liébray (1969)
Zweibrücken	RFr	Castleman (1975)
Wackernheim, Nackenheim, Alzey, Wallertheim, Bechtheim	RFr	Karch (1981)
Gabsheim	RFr	Post (1987)
Michelstadt	RFr	Durrell & Davies (1989)
Birkenfeld	MFr	Baldes (1896)
Kenn	MFr	Thomé (1908)
Kreis Ottweiler	MFr	Scholl (1912)
Arzbach	MFr	Bach (1921)
Burg-Reuland	MFr	Hecker (1972)
Bell	MFr	Mattheier (1987)
Horath (Hunsrück)	MFr	Reuter (1989)
Beuren	MFr	Peetz (1989)
Luxembourg	MFr	Gilles (1999)
Montabaur	MFr	Féry (2017)
Cologne	Rpn	Wahlenberg (1877)
Area north of Aachen	Rpn	Schmitz (1893)
Schlebusch	Rpn	Bubner (1935)
Aachen	Rpn	Welter (1938)
Cologne	Rpn	Heike (1964)
Gleuel	Rpn	Heike (1970)
Elsenborn	Rpn	Hecker (1972)

Place	Dialect	Source
Burscheid	Rpn	Heinrichs (1978)
Krefeld	Rpn	Bister-Broosen (1989)
Erp (Erftstadt)	Rpn	Kreymann (1994)
Niederbachem, Oberbachem	Rpn	Fuss (2001)
Frankfurt am Main	CHes	Rauh (1921), Bethge & Bonnin (1969), Féry (2017)
Petersberg (Fuda)	EHes	Schwarz (1992)
Kreis Rosenberg	HPr	Kuck (1933)
In and around Chemnitz	USax	Große (1955)
Leipzig	USax	Große (1957)
Vorerzgebirge	USax	Bergmann (1965)
Kreis Oschatz	USax	Bethge & Bonnin (1969)
Chemnitz	USax	Kahn & Weise (2013)
Gera	Thrn	Dietrich (1957)
East Thuringia	Thrn	Spangenberg (1974, 1989)
Berlin	NUSax-SMk	Schönfeld (2001)
Aschafftal	EFr	Hirsch (1971)
Barr	LAlmc	Keller (1961)
Benfeld	LAlmc	Rünneburger (1985)
Colmar	LAlmc	Philipp & Bothorel-Witz (1989)
Sępóno Krajeńskie	EPo	Darski (1973)

Data from linguistic atlases complement my own findings on the areal distribution of alveolopalatalization in Table 10.1. In particular, the following three atlases reveal that alveolopalatalization is the norm throughout the Rpn/MFr/RFr dialect areas: (a) MRhSA for MFr/RFr; (b) SNBW for the northwest corner of the German state of Baden Württemberg between Mannheim and Heidelberg (RFr); and (c) SUF for Northwest Bavaria in the general vicinity of Aschaffenburg (RFr).[11,12]

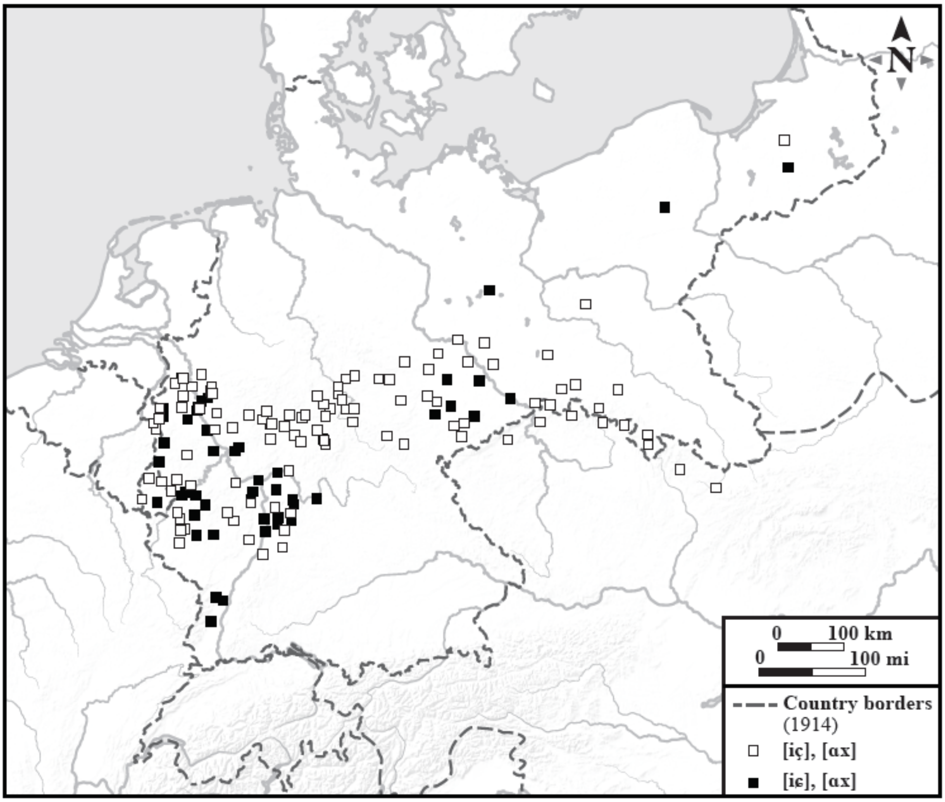
The most important conclusion to be drawn from Table 10.1 is precisely what Herrgen (1986) determined over thirty years ago: Alveolopalatalization is feature of CGm. That assessment is illustrated visually in Footnote 10.1, which indicates that alveolopalatalizing varieties (black squares) predominate in CGm areas. Also indicated on Footnote 10.1 are the CGm varieties listed in Appendix C which make no reference to alveolopalatalization (white squares).

On the basis of Table 10.1 and Footnote 10.1 five generalizations can be made: (A) Alveolopalatalization is much more robustly attested in WCGm than in ECGm; (B) within WCGm, alveolopalatalization is considerably more common in CFr (Rpn/MFr) and RFr than in NHes/CHes/EHes; (C) within ECGm, alveolopalatalization is typical of USax and (East) Thrn but not at all for Sln; (D) even in the CGm regions where alveolopalatalization is most prevalent, there are still conservative places which retain the original palatal fricative [ç]; and (E) alveolopalatalization is also attested in a few places outside of the CGm dialect region (i.e. one attestation for HPr and three for LAlmc). I consider below (D) in more detail. (E) is discussed in §10.6.

(D) is shown on Footnote 10.1 by the presence of many white squares. (D) can also be illustrated by focusing on specific alveolopalatalizing areas. Consider RFr (Footnote 5.3). As indicated on that map, many of the fifteen alveolopalatalizing RFr places from Table 10.1 are situated within close proximity. However, the other sources for RFr indicated on Footnote 5.3 do not document alveolopalatalization, e.g. Heeger (1896: 4), Wanner (1908: 67), Wenz (1911: 44), Reichert (1914: 9, 74), and Seibt (1930: 57–58) to name a few. A similar finding for Rpn is discussed in Cornelissen (2000: 398–399), who provides a map of alveolopalatalizing and non-alveolopalatalizing towns in the area between Rpn and LFr (recall Footnote 5.1). Map 349 for *Kirche* 'church' in volume 4 of MRhSA similarly depicts a number of places with [ç] surrounded by places with the alveolopalatal.

[11]Maps 8 and 11 in WSAH document alveolopalatalization in parts of the German state of Hesse between Gießen and Darmstadt (CHes and RFr). Other linguistic atlases reveal that there are parts of WCGm with very little alveolopalatalization, e.g. ALLG. The maps in that source (e.g. Map 269 for *Milch* 'milk') show that alveolopalatalization (=⟦š⟧) is the exception rather than the rule in German Lorraine.

[12]In several dialect dictionaries alveolopalatalization is either commented on in the pronunciation guide and/or expressed directly in the spelling *sch* (for etymological [ç]). Examples for Rpn include AaWb, DrWb, KWb, TrWb, WbKM. RFr is represented by SaWb. Alveolopalatalization is also evident from the phonetically transcribed texts in towns and villages throughout the Rpn/MFr dialect areas in Cornelissen et al. (1989). Several places from that source in the Rpn dialect region are indicated on Footnote 5.1.



Map 10.1: Areal distribution of alveolopalatalization. High German (Central German and Low Alemannic) varieties (and one variety of Low German) with alveolopalatalization are indicated with black squares. Varieties of Central German without alveolopalatalization are indicated with white squares.

Although a number of conclusions concerning alveolopalatalization can be drawn from Table 10.1 and Footnote 10.1, there is an additional factor that has unfortunately not been taken into consideration, namely the time dimension. The point is that it is possible for a dialect in a particular place to be be non-alveolopalatalizing at one point in time but as alveolopalatalizing at a later point. Consider the following two examples:

Jardon (1891) discussed the Rpn dialect spoken in and around Aachen at the end of the nineteenth century and gave no indication in his book for alveolopalatalization. Forty-seven years later Welter (1938) also described the Aachen dialect, but he consistently transcribed the fortis palatal fricative [ç] with ⟦š⟧, suggesting that the various stages of alveolopalatalization posited above had been complete at the time he conducted his fieldwork. Welter's observations concerning the realization of [ç] has also been documented in the 1970 dictionary for the Aachen dialect (AaWb), p. XL, XLI. A similar conclusion can be drawn for descriptions of the Saarbrücken dialect: Kuntze (1932) transcribed the historical palatal fricative with the traditional symbol ⟦χ⟧ and only mentioned in passing (p. 94) that ⟦χ⟧ is often replaced with ⟦š⟧. Forty-nine years later, Steitz (1981) transcribed historical [ç] – and historical [ʃ] – consistently as ⟦ʃ⟧ in his description of the Saarbrücken dialect, but he made no mention at all of the earlier pronunciation with [ç]. In the pronunciation guide of the 1984 dictionary for the Saarbrücken dialect (SbWb) the distinction between *ch* ([ç]) and *sch* ([ʃ]) is likewise completely neutralized to *sch* ([ʃ]), e.g. *Fisch* 'fish' and *Biescher* 'books' (pp. 11–22). No mention is made in SbWb of the ich-Laut.[13]

These examples confirm the conclusion already made by Große (1957) for USax: Alveolopalatalization is an example of change in progress. The shortcoming of Footnote 10.1 is that the status the of the non-alveolopalatalizing places (white squares) is subject to change through time. Those markers depict places that were described without alveolopalatalization many years ago, but a closer examination of those same places today may reveal that the change from [ç] to [ɕ] has already taken place.

10.6 Discussion

The present section considers three topics alluded to earlier, namely the origin and spread of alveolopalatalization (§10.6.1), the realization of the lenis nonsibilant fricative [ʝ] (§10.6.2), and changes involving underlying representations (§10.6.3).

10.6.1 Origin and spread of alveolopalatalization

Alveolopalatalization is a relatively recent phenomenon with its first attestations in the second half of the nineteenth century (Herrgen 1986: 97ff.). To the best of my knowledge the earliest sources referring to the phenomenon are Wahlenberg (1877: 21) for Cologne, Trautmann (1884–1886: 281) for the area south of Leipzig, Reis (1892) for Mainz, and Schmitz (1893: 150) for the area north of Aachen. Wahlenberg (1877: 281) writes of the pronunciation of ch:

[13] On the other hand, alveolopalatalization is attested early in other places, e.g. Rauh (1921: 11) is explicit that Frankfurt am Main already had it in 1921, long before Féry's (2017) study confirmed that finding for a later generation of speakers. See §10.6.1 for even earlier attestations of alveolopalatalization in other cities.

> …mit harter, gutturaler Aussprache, nach a o ǫ u au und mit weicher, palataler und dem sch liegender Aussprache nach e ę i ö ǫ̈ ü ei äu …
>
> ' … with [a] hard, guttural pronunciation after a o ǫ u au and with [a] soft, palatal pronunciation close to [that of] sch after e ę i ö ǫ̈ ü ei äu …'

A scrutiny of the literature cited throughout this chapter on alveolopalatalization reveals that the emergence of [ɕ] did not simply occur at one particular time and place (monogenesis), but that it instead transpired at different places – typically urban areas – within the CGm dialect area and at different times for any given area (polygenesis). The dialects referred to here can therefore be thought of as ALVEOLOPALATALIZING ISLANDS. To cite one of the sources cited above, Reis (1892) observes the change to [ɕ] (=⟦sch⟧) in the late nineteenth century pronunciation of Mainz German (Footnote 5.3), but some of the related MFr varieties indicated on Footnote 5.3 in the neighborhood of Mainz (written during the same general time frame) made no mention of alveolopalatalization. Recall from the previous section that the RFr varieties in Table 10.1 are surrounded by other RFr varieties without alveolopalatalization.

The clearest case of an alveolopalatalizing island is the variety of HPr described by Kuck (1933), which was once spoken in Kreis Rosenberg in West Prussia (Footnote 11.2). In particular, Kuck (1933: 148) observes that the fortis palatal fricative [ç] (=⟦χ⟧) is pronounced as ⟦š⟧, especially among young speakers. Significantly, Kreis Rosenberg appears to be unique for its area because alveolopalatalization has not been documented for other varieties of German once spoken in that general region (Chapter 11).

There are two additional examples of alveolopalatalizing islands listed in Table 10.1. The first is the only LGm variety known to me with alveolopalatalization (Sępóno Krajeńskie). The original source for that place (Darski 1973) consistently transcribes the modern reflex of historical [x] as [x] after back vowels and as [ɕ] after front vowels, e.g. [hɛʊx] 'high' vs. [rɛɕt] 'right'. The second example is a cluster of three places (LAlmc) in Alsace, namely Barr, Benfeld, and Colmar (Footnote 3.1). The sources listed earlier for those three varieties are clear that alveolopalatalization is under way, especially among the younger generation of speakers. That alveolopalatalization for Alsace is exceptional is clear from an examination of the maps in ALA. For example, Map 217 shows the realization of the etymological palatal [ç] as alveolopalatal (⟦š⟧) for the word *Hecht* 'pike' is restricted to a small area (Sainte-Marie-aux-Mines) to the northwest of Colmar.

The investigation of alveolopalatalization from the sociolinguistic perspective also points to alveolopalatalizing islands. See, for example, Auer (2002: 25ff.), Wiese (2012: 38), and Jannedy & Weirich (2014) on the realization of [ʃ ç] as [ɕ] in various ethnolects spoken in Berlin.

The upshot of all of the studies cited above is the following: Alveolopalatalization did not occur in a single place and from there spread outwards in terms of space (and time). Instead, the evidence suggests that polygenesis is the correct interpretation.

Another point made in the literature is that alveolopalatalization is an intergenerational change (§2.5). This point is especially clear in Kuck's (1933) observation that alveolopalatalization in Kreis Rosenberg was initiated by young speakers. That alveolopalatalization involves intergenerational change is especially prominent in descriptions of USax and Thrn. For example, in his study of the Thrn dialect spoken in Gera (Footnote 7.2), Dietrich (1957: 61) notes that [ç] shows the effects of alveolopalatalization among younger speakers (especially female). In one of his study on USax, Große (1955: 49) writes: "Man kann sagen, daß die älteste Generation nur ganz selten, die mittlere occassionell, die jüngere schon mit vielen Vertretern usuell χ' artikuliert". ['One can say that the oldest generation articulates χ (=[ç], T.A.H.) only rarely, the middle generation occasionally, and the younger generation quite often [lit. 'with many representatives']'.

Although it is not possible to conclude from the works cited in Table 10.1 that alveolopalatalization involves more than one stage, this conclusion can be reached on the basis of the CGm dialects described in §10.3 and §10.4. Those studies suggest that alveolopalatalization affected first the palatal allophone [ç] produced by velar fronting (Stage B) and only later [ʃ] (Stage C). As noted above, the data from Frankfurt am Main/Montabaur suggests that Delabialization (/ʃ/ > /ɕ/) did not simply restructure every instance of /ʃ/ to /ɕ/ in one fell-swoop in a context-free fashion. Instead, the data from Féry's speakers indicates that the change from /ʃ/ to /ɕ/ occurs only in the context after front unrounded vowels.

One can speculate that Delabialization in all alveolopalatalizing dialects exhibits a gradual broadening of the context according to the rule generalization model described in §2.4.1: The change occurs first after front unrounded vowels and only later is the change extended to all other contexts. The Frankfurt am Main/Montabaur data reflect the first stage and the remaining dialects discussed above the second stage. Future research on dialects currently undergoing alveolopalatalization may shed light on the incremental changes described here.

Stage C dialects (e.g. Schlebusch, Luxembourgish, Leipzig) represent focal areas because they exhibit alveolopalatalization to its fullest extent. When alveolopalatalization was first phonologized in those places it reflected the more narrow Stage B dialects.

In any case, the evidence is clear that alveolopalatalization affected first [ç] and only later [ʃ] – a generalization deriving support from the modern dialects discussed above. Additional evidence for my claim comes from unattested dialects. In particular, no dialect has been uncovered in the present survey in which alveolopalatalization affects only [ʃ] but not [ç]. The type of unattested synchronic system described here is depicted in (38a). Likewise no dialect is known in which there is a three-way contrast among velar, palatal, and alveolopalatal (=38b). Note that the system in (38b) would be a dialect like the ones described in Chapter 9 in which /x/ and /ç/ are phonemic together with Delabialization of earlier /ʃ/ to /ɕ/.

(38) a. /x/ → [x], [ç]; /ɕ/ → [ɕ]

b. /x/ → [x]; /ç/ → [ç]; /ɕ/ → [ɕ]

If the systems in (38) are truly unattested then the conclusion is that alveolopalatalization affected first the palatal [ç] and only later on the postalveolar [ʃ], which is precisely the progression presupposed in the present chapter (recall 3-5). Only future studies on alveolopalatalization in progress can lend further support to my observation.[14]

10.6.2 Realization of the lenis palatal fricative [ʝ] in German dialects

Recall from §10.3.1 that Schlebusch targets both /x/ and /ɣ/ for velar fronting but that of the two [coronal, dorsal] sounds created by that process only the fortis one is interpreted as a sibilant (by 8a). By contrast, the lenis palatal fricative ([ʝ]) fails to surface as alveolopalatal (*[ʑ]). It interesting to observe that the realization of [ʝ] as a nonsibilant holds for any [ʝ] in Schlebusch, regardless of the synchronic or diachronic source. In particular, there is the palatal [ʝ] deriving from /ɣ/ by velar fronting in words like [be:ʝə] ‘bend’ (=⟦bē:jə⟧) from (18b) as well as word-initial [ʝ] deriving from either WGmc +[j] in words like [ʝɔ:] ‘yes’ (=⟦jǫ⟧) or from WGmc +[ɣ] in items like [ʝɛl] ‘yellow (=⟦jęl⟧); recall (12b).

The same generalizations involving [ʝ] hold for the other two dialects discussed above with that sound. In Cologne (§10.4.1) the lenis fricative [ʝ] surfaces as a nonstrident sound in a word-internal onset, e.g. [fʏʝəl] ‘birds’ (=⟦fʏjəl⟧) from (34c), and word-initially, e.g. [ʝəze:ɕ] ‘face’ (=⟦jəze:£⟧) from (34a). The facts are

[14] In a dialect I discuss below (Dithmarschen), I point out that a possible interpretation of the system of fortis fricatives is precisely the one depicted in (38a).

essentially the same in for Lxm [ʝ] alluded to in §10.3.2. See Gilles (1999) for discussion.

There are two lenis palatal fricatives that need to be distinguished: (a) Palatal [ʝ] that is the modern reflex of an earlier velar (WGmc ⁺[ɣ]), and (b) palatal [ʝ] that is the modern reflex of the palatal glide (WGmc ⁺[j]). The [ʝ] in (a) appears to be immune to phonetic implementation rules akin to the ones in (6–8) in all dialects discussed in the present book. That generalization holds for [ʝ] in word-initial position, as well as [ʝ] in a word-internal onset. Examples for both contexts were given above for Schlebusch. For additional dialects with [ʝ] the reader is referred to the case studies discussed below in Chapters 11-13.

One might suggest that there are CGm dialects in which the [ʝ] from an earlier velar is in fact a sibilant ([ʑ]) but that the linguists describing the dialects in question chose to ignore that detail. I consider that scenario to be unlikely. Authors of Ortsgrammatiken placed a great deal of emphasis on phonetic detail. Recall from Chapter 1 that many of the authors of those works were well-versed in phonetics and also that phonological notions like phonemes and allophones had not yet been discovered. If historical [ç] is realized as a sibilant and assigned a new phonetic symbol, why not do the same with historical [ʝ]? It is also important to stress that a sound similar to the lenis equivalent of [ɕ] was known to all of the authors of Ortsgrammatiken, namely the lenis counterpart to the postalveolar fricative [ʃ] (=[ʒ]), which is present in many loanwords from French, e.g. *Etage, Journal*.

It is surprisingly difficult to find descriptions of German dialects in which historical [ʝ] (<WGmc ⁺[ɣ]) is realized as alveolopalatal. I tentatively consider this gap as systematic because the facts follow from the way the phonetic implementation rules in (6–8) are stated. Future research might investigate whether or not there are dialects like the ones I have been unable to find.[15] ⁺[j]) as a sibilant but his source (Grimme 1922) does not provide clear examples indicating that change. More recently, Goltz & Walker (1989: 42) note without comment that the etymological palatal in NLGm (their North Saxon) is "… often realized as the fricative [ʒ] or the affricate [dʒ]".

Several dialects are reported to have a lenis – presumably sibilant – realization of the etymological palatal. Eight such dialects (all LGm) are known to me. I present data and a brief analysis for one of those dialects below and make passing reference to the other seven. In contrast to the alveolopalatalizing dialects discussed in the first part of this chapter very little is known about the dialects discussed below.

[15] Schirmunski (1962: 369–370) observes that certain LGm dialects realize [ʝ] (<

Kohbrok (1901) describes a NLGm dialect spoken in the county of Dithmarschen on the west coast of the German state of Schleswig-Holstein (Footnote 4.1). The significance of Dithmarschen is that the modern reflex of the etymological palatal is a lenis fricative Kohlbok represents as ⟦ž⟧, which he describes (pp. 15–16) as the voiced (lenis) equivalent of [ʃ] (=his ⟦š⟧). I interpret Kohlbok's ⟦ž⟧ as the lenis alveolopalatal fricative and therefore transcribe it below as [ʑ̊].[16].

The realization of WGmc ⁺[j] in Dithmarschen as [ʑ̊] is illustrated for word-initial position before any type of vowel (in 39a) or in a word-internal onset (in 39b). [ʑ̊] does not surface in syllable-final position. The data in (39c,d) demonstrate that Dithmarschen also has [x] in the context after a back vowel and [ç] after a front vowel. Significantly, the [ç] in (39d) is not realized as an alveolopalatal ([ɕ]). There is no lenis fricative [ʝ] (<WGmc ⁺[ɣ]) in Dithmarschen because that historical sound either deleted or restructured to [g] (/g/) by g-Formation-1 (§4.2). Fortis postalveolar [ʃ] (=⟦š⟧) occurs initially and finally (in 39e). That fricative derived historically from WGmc ⁺[sk].

(39) Dithmarschen fricatives:

a.	žōɑ	[ʑ̊oːɐ]	Jahr	'year'	75
	žym	[ʑ̊ym]	ihr, euch	'you-PL'	71
	žyg	[ʑ̊yg]	Joch	'yoke'	30
	žø̄ɑn	[ʑ̊øːɐn]	Jürgen	'(name)'	71
b.	kɒužə	[kɒuʑ̊ə]	Koje	'berth'	75
c.	ɑχdɑ	[ɑxdɐ]	hinter	'behind'	72
	doχtɑ	[doxtɐ]	Tochter	'daughter'	75
	hɒuχ	[hɒux]	hoch	'high'	75
d.	ryx	[ryç]	Rücken	'back'	70
	rex	[reç]	recht	'right'	27
	stīx	[stiːç]	Steig	'hill-climbing'	32
e.	šūɑ	[ʃuːɐ]	Schauer	'shower'	74
	šrĩm	[ʃrĩm]	schreiben	'write-INF'	74
	diš	[diʃ]	Tisch	'table'	74

As in all other LGm varieties investigated in this book, WGmc ⁺[j] (/j/) underwent Glide Hardening to pre-Dithmarschen ⁺[ɟ] (/ɟ/). Dithmarschen is unique

[16] Stammerjohann (1914) offers a phonetic study of the sounds in the NLGmc community of Burg in the county of Dithmarschen. While he concurs that Burg possesses ⟦ž⟧, he stresses that the phonetic facts of the Burg variant of that sound are not exactly the same as they are for Kohbrok's speakers. In particular, the tongue tip for ⟦ž⟧ lies closer to the alveolar ridge than it does for ⟦š⟧; Stammerjohann (1914: 67)

in that the new palatal fricative is now realized as [ʑ]. The phonological representation for the two fricatives in question ([ʝ] and [ʑ]) is identical, namely [coronal, dorsal]. The change from the former to the latter therefore did not involve phonology at all, but instead fell within the realm of phonetic implementation. At the pre-Dithmarschen stage only simplex coronal fricatives were interpreted by phonetic implementation as sibilants (by 6b). The change from pre-Dithmarschen to Dithmarschen therefore involved the retention of (6b), which is restated in (40b), and the addition of a special provision for complex lenis fricatives (in 40a).[17]

(40) Phonetic Implementation:

a. Lenis complex fricatives ([coronal, dorsal]) are interpreted as sibilants ([ʑ]).

b. Simplex [coronal] fricatives are interpreted as sibilants ([s, z, ʃ]).

The original source for Dithmarschen also makes clear that the dialect possesses other simplex coronal fricatives: (a) a voiceless ('stimmlose') dental fricative (=⟦ʃ⟧) occurring word-initially before a vowel (e.g. [siːd] (=⟦ʃīd⟧ 'side'), and (b) a (nonstrident) lenis dental fricative [ð], e.g. [foːðɐ] 'father' (=⟦fōðɑ⟧), which is the modern reflex of WGmc $^{+}$[d] in the context after a vowel, but only before the vocalized-r. It appears that [ð] is still an allophone of /d/ in the synchronic phonology. I leave open how to analyze those additional fricatives, but in any case those structures must be made immune to (40a).

Seven additional varieties are known to me of LGm dialects in which the etymological palatal is realized as a lenis – presumably alveolopalatal sibilant – fricative [ʑ]. Those places (together with Dithmarschen) are listed in Table 10.2, which I comment on below.

The closest place listed in Table 10.2 to Dithmarschen geographically is Bergenhusen (Sievers 1914; Footnote 4.1). An examination of the words listed in the historical part of that book with WGmc $^{+}$[j] reveals that they have replaced that sound with a sibilant. The facts are the same in Diepenau (Schmeding 1937; Footnote 4.1). According to that source (pp. 43–44), WGmc $^{+}$[j] is regularly realized as ⟦ž⟧ in word-initial position, e.g. ⟦žǭ⟧ 'yes' (cf. MoStGm *ja*), ⟦žūxn⟧ 'cheer-INF' (cf. MoStGm *jauchzen*). Höder (2010: 7) similarly observes that WGmc $^{+}$[j] can

[17] As noted earlier, virtually nothing is known about the phonology and phonetics of data like the ones in (39). Hence, other analyses are conceivable. For example, one could analyze [ʃ] as [coronal, labial] and restate (40a) so that [coronal, labial] fricatives (both lenis and fortis) are interpreted as sibilants. It might also be the case that what I transcribe as [ʃ] is really alveolopalatal [ɕ], suggesting that Dithmarschen represents the unattested system in (38a).

Table 10.2: Varieties of WLGm (upper box) and ELGm (lower box) in which WGmc ⁺[j] is realized as a sibilant fricative ([ʑ]).

Place	Dialect	Source
Burg (Dithmarschen)	NLGm	Kohbrok (1901), Stammerjohann (1914)
Bergenhusen	NLGm	Sievers (1914)
Diepenau	NLGm	Schmeding (1937)
Altenwerder	NLGm	Höder (2010)
Lüneburger Wendland	Brb	Selmer (1918)
West Mecklenburg	MeWPo	Kolz (1914)
South Mecklenburg	MeWPo	Jacobs (1925a,b, 1926)
Kaarβen	MeWPo	Dützmann (1932)

be realized in Altenwerder as a sibilant fricative in initial position. The ELGm varieties in Table 10.2 are depicted on Footnote 11.1. For the Brb variety of the Lüneburger Wedland, Selmer (1918: 55–57) observes that WGmc ⁺[j] is realized as ⟦ž⟧, which he refers to as the 'assibilated' ('assibilierte') realization of the etymological palatal. The same generalization holds in the three varieties of MeWPo listed above. Kolz (1914: 148) observes that for speakers in rural areas (his "Lingua vulgaris=Lv.") WGmc ⁺[j] is realized as a sibilant fricative. Jacobs (1925b: 123) observes that WGmc ⁺[j] is regularly realized as ⟦ž⟧ in onset position ('Anlaut'), e.g. ⟦žå̄˙⟧ 'yes', ⟦ho˙žå̄˙n̄⟧ 'yawn-INF' (cf. MLG *hojanen*).[18] Finally, in his list of consonants for Kaarβen, Dützmann (1932: 12) lists no [j] (or fricative [ʝ]). In his discussion of the phonetics (p. 14), he remarks that the etymological palatal (his ⟦ž⟧) is 'formed like [š]' ('Es bildet sich wie das š').[19]

10.6.3 Underlying representations

Recall from the discussion of Schlebusch (§10.3.1) that there are two types of words with [ç] after a front vowel: Those in which [ç] is underlyingly /ç/ (in 14) and those in which [ç] is underlyingly /x/ (in 17). As noted earlier, the [ç] in all of

[18] Jacobs (1925b: 130) gives one example in which the modern reflex of historical [ɣ] is ⟦ž⟧, namely ⟦brü˙žå̄˙m⟧ 'bridegroom' (cf. MoStGm *Bräutigam*). This appears to be an exceptional form, since historical [ɣ] is usually realized in South Mecklenburg as [g] between vowels.

[19] The dictionary for the Schleswig-Holstein dialect (SchlHWb) consistently transcribes [ʝ] as ⟦ž⟧ (=[ʒ]), e.g. *Gicht* 'gout' (⟦žixt⟧) and *jung* 'young' (⟦žuŋ⟧). Since SchlHWb is intended to reflect a large area, the implication is that the realization of [ʝ] as a sibilant is much more widespread than what is suggested by the small list of places in Table 10.2.

those words does not alternate with another sound. Underlying and phonetic representations for representative examples from those two datasets are presented in (41a) and (41b) respectively. The Stage C column represents Schlebusch as it was described in 1935 by Rudolf Bubner. Stage B represents the pre-Schlebusch stage before Delabialization restructured /ʃ/ to /ɕ/. I describe Stage D below. In the final column I indicate the diachronic source of alveolopalatal [ɕ] in these items.

(41)		Stage B:	Stage C:	Stage D:		
	a.	/veʃ/ [veʃ]	/veɕ/ [veɕ]	/veɕ/ [veɕ]	'fish'	< [ʃ]
	b.	/ex/ [eɕ]	/ex/ [eɕ]	/eɕ/ [eɕ]	'I'	< [ç]

The examples here are drawn from a specific Rpn-speaking community (Bubner 1935), although the issue discussed here holds for all Stage C varieties.

The underlying representations for pre-Schlebusch (Stage B) are justified because [ɕ] at that point was still an allophone of /x/ and /ʃ/ was uncontroversially a contrastive (phonemic) sound. At issue are the underlying representations at Stage C: How are post-1935 speakers of Schlebusch not knowledgeable of the history of their dialect able to deduce that surface [ɕ] is /ɕ/ in (41a) but /x/ in (41b)?

I argue that /veɕ/ 'fish' /ex/ 'I' were correct for the first generation of Stage C speakers of Schlebusch. The first generation individuals referred to here were those speakers who were the first to restructure underlying representations like /veʃ/ to /veɕ/. However, once later generations were exposed to words like [veɕ] and [eɕ] it was inevitably the case that the Stage B (and first generation Stage C) underlying representation for /ex/ was restructured to /eɕ/. That modification occurs at Stage D. The reason for that restructuring is that those speakers were ignorant of the history of their dialect and that there was no evidence for analyzing [eɕ] as anything other than /eɕ/. This point aside, Stage D speakers inherited Velar Fronting-1 in order to account for [x]~[ɕ] alternations like the ones in (15). The underlying and phonetic representations for a representative example for Pre-Schlebusch (Stage B) and Schlebusch (Stage C/D) are presented in (42):

(42)		Stage B:	Stage C/D:		
	a.	/lɔx/ [lɔx]	/lɔx/ [lɔx]	'hole'	< [x]
	b.	/løːx-ə/ [løːɕə]	/løːx-ə/ [løːɕə]	'holes'	< [ç]

Significantly, the restructuring of /ex/ 'I' to /eɕ/ by Stage D speakers (in 41b) did not affect the underlying representations of alternating examples like the ones in (42). That restructuring did not occur in items like [løːɕə] 'holes', which continued to be analyzed with /x/ as /løːx-ə/ because of the related form with [x] (i.e. [lɔx]).

Recall from earlier chapters that underlying palatals which derived historically from velars – palatal quasi-phonemes and phonemic palatals – invariably occur in the context of a back vowel. The treatment of Stage D nonalternating morphemes (in 41b) is significant because it reveals that there are also some dialects in which underlying palatals (/ɕ/) deriving from etymological velars also occur in the context of front vowels. The change from Stage C /x/ to Stage D /ɕ/ after a front vowel (in 41b) may appear to involve a version of velar fronting, but closer examination reveals that the change in question was not phonological. First, the replacement of /x/ with /ɕ/ after front vowels failed to affect the /x/ in alternating examples (in 42b). And second, the change from velar fricative to its fronted counterpart involved the restructuring of underlying representations, but no version of velar fronting in any of the dialects discussed in Chapters 3-9 alters underlying representations. It is also possible that the change from /x/ to /ɕ/ in (41b) might not have affected all words like /eɕ/ 'I' at once, but instead that it occurred on a word-by-word basis. Since no evidence is present in any of the original sources for Stage C dialects which bears on this question I leave that possibility open.

10.7 Conclusion

This chapter has investigated alveolopalatalization ([ç ʃ] > [ɕ]), which is a common feature of CGm dialects. It was argued above that the historical change from [ç ʃ] to [ɕ] involved two distinct changes, namely (a) the change from [ç] to [ɕ] (Stage B) followed by the change from [ʃ] to [ɕ] (Stage C). At Stage B [ɕ] was still an allophone of /x/ and had not yet merged with [ʃ] (/ʃ/). At Stage C the alveolopalatal fricative [ɕ] is phonemic (/ɕ/) because it contrasts with [x] (/x/) in the context after back vowels. The allophonic rule of velar fronting at Stage B was inherited at Stage C as a rule neutralizing the contrast between /x/ and /ɕ/ in the context after front vowels. Velar fronting at Stage B and at Stage C does not differ formally from the eponymous rule discussed for other dialects in earlier chapters: The feature [coronal] spreads from a front segment to a [dorsal] target (/x/), thereby producing a complex [coronal, dorsal] segment. That feature complex is interpreted as a sibilant ([ɕ]) at Stage B and Stage C by phonetic implementation.

11 Velar noncontinuants as targets

11.1 Introduction

The focus of the present chapter lies in German dialects in which the set of velar fronting targets includes one or more velar noncontinuant in addition to one or more velar fricative (/ç/ or /ʝ/). Velar noncontinuants are defined here as velar stops (/k g/) and the velar nasal (/ŋ/). When those sounds undergo fronting, the corresponding palatals are created, namely [c ɟ ɲ]. The investigation is oriented towards those palatal noncontinuants in native words which derived from either etymological velars or from new velars created by independent changes. It is demonstrated below that the historical rule of velar fronting is active synchronically, although the version of that process can differ depending on the type of segments that serve as targets and/or triggers.

In terms of area, the dialects investigated are – for the most part – situated in the northeast of pre-1945 Germany (Footnote B.1 in Appendix B), a region comprising the former provinces of East Pomerania (Ostpommern), Posen, West Prussia (Westpreußen), and East Prussia (Ostpreußen). From the perspective of dialect affiliation, the varieties in question belong to ELGm (EPo, LPr) and ECGm (HPr). Three places outside of the region described above are attested in which velar noncontinuants serve as triggers for fronting. Those three outliers are (a) one variety of ELGm (MeWPo) in the far west of the modern-day German state of Mecklenburg-Vorpommern and (b) two ECGm varieties (both Sln) in the southeast of the modern-day German state of Saxony (Sachsen).

The material presented below is significant because it provides evidence from dialects described in the modern era for two distinct stages of velar fronting: A first stage with a narrow set of targets (fricatives) and a later stage with an expanded set (velar consonants).

Since most of the places discussed below were situated in the eastern realm of the German-speaking world prior to 1945, they were therefore coterritorial with Slavic languages which are known for consonants phonetically similar to [c ɟ ɲ]. Although the change from velar noncontinuants to the corresponding palatals was was uncontroversially endemic to German, I suggest that contact with Slavic languages probably played a role in their phonologization.

As indicated in the title, the focus is on dialects with an expanded set of target segments for velar fronting. However, this chapter also considers the extent to which velar fronting triggers can differ depending on dialect. The generalizations concerning targets, triggers, and outputs are stated here:

Targets: These segments can consist of some subset of the class of velar consonants (/x ɣ k g ŋ/). In some places that set of target sounds can be broad (velar consonants), and in others narrow (velar fricatives).

Triggers: These sounds can vary from place to place. Many varieties have the broadest set of triggers (coronal sonorants), while others have a narrower set (e.g. front vowels, nonlow front vowels).

Outputs: In the dialects described below the target sound does not change its manner of articulation when fronted; hence, the manner of the target sound is the same as the manner of the output (after velar fronting). This means that the velar fricatives /x ɣ/ surface as palatal fricatives – alveolopalatalization is not a typical feature of this area – and that the velar nasal /ŋ/ surfaces as the palatal nasal. Generally speaking, the same statement holds for stops, so /k g/ surface as the corresponding palatals ([c ɟ]). For one variety discussed below in §11.5 /k g/ are realized as palatal fricatives when fronted; however, it is demonstrated in that section that velar fronting only alters place (velar→palatal) and that continuancy (stop→fricative) is assigned by a separate process.

It has been observed (e.g. Mitzka 1943: 125) that the fronted realization of velar stops /k g/ in EPo can be affricates (e.g. [tʃ dʒ]). I do not dispute that observation, although it needs to be stressed that the affricate realization is not well-documented in the sources cited below. It is possible that velar fronting is simply responsible for shifting /k g/ to palatal stops and the realization of those palatal stops as affricates is due to phonetic implementation (§2.2.1). It is also conceivable that the change from /k g/ to affricates is accomplished in the phonology and not in the phonetics; if so, that interpretation suggests that the change reflects an instance of the broader set of outputs characterized by velar palatalization (§2.3.1). Since the data discussed below do not allow one to decide which of the two interpretations is correct, I simply leave the question open.[1]

[1]Recall from Appendix I that the historical process usually referred to as velar palatalization typically has affricates as output sounds in Slavic, Romance, North Germanic, and West Germanic (English, Frisian).

Since the output parameter does not play a significant role, I concentrate below on triggers/targets. The trigger/target parameters are important because they shed light on the way in which velar fronting spread through time and space – a topic dealt with at greater length in Chapter 12 and Chapter 13.

The velar sounds that constitute the set of targets for velar fronting consist not only of historical velars, but also of velars created from etymologically non-velar sounds. The two changes referred to are presented in (1):

(1) a. Wd-Initial Nasal Place Assimilation: [n] > [ŋ] / $_{\text{wd}}$[k __
    b. Gutturalization: [nd nt] > [ŋ] / __

Wd-Initial Nasal Place Assimilation creates [kŋ] clusters that are realized as [kn] in other dialects (cf. MStGm [knɔxən] 'bone'). That new [kŋ] sequence is a potential target for velar fronting if that process applies in word-initial position. I make the noncrucial assumption here that postvocalic velar nasal plus velar stop sequences ([ŋk]) were inherited (from WGmc $^{+}$[ŋk]) and that there never was a stage in which [nk] was attested. Gutturalization is the traditional name for the change from alveolar to velar depicted in (1b); see Schirmunski (1962: 395–400) and Werlen (1983). For example, the cluster [nt] preserved in MoStGm words like *unten* [ʊntən] 'under' is realized in gutturalizing dialects as [ŋ]. That sound is a potential target for velar fronting provided that a front segment precedes it.[2]

Many of the dialects discussed in this chapter possess underlying palatal non-continuants (palatal quasi-phonemes and/or phonemic palatals), i.e. /c ɟ ɲ/. All dialects have the etymological palatal (/j̥/). Since the following case studies are quite complex, I attempt to economize by referring on occasion to underlying palatals without specifying the type of palatal and only make passing reference to the distinction between palatal quasi-phonemes, phonemic palatals, and etymological palatals.

I economize in another way as well. In particular, given the large number of targets and triggers it is not feasible to provide a sample word for each phonemic vowel in the neighborhood of every target segment for word-initial and post-sonorant position in each of the dialects investigated. The correct context for each case study was determined on the basis of the data in the original sources; hence, I typically provide only one or two examples representing a particular context (e.g. a word containing /ex/ for all front vowels before /x/). I likewise do not provide a complete set of phonemic vowels for every case study.

[2]In many dialects Gutturalization only applies after high vowels like /i u/. The target segments can also include the singleton velar nasal as well as velar stops. These are unessential details and are therefore not discussed.

In places with phonemic palatals those sounds exhibit the Contrast Type B system discussed at length in Chapters 8-10. As illustrated in (2), such dialects possess a contrast between velars and palatals in the context of back vowels (represented as [ɑ]), but in the context of front vowels (represented as [i]) only palatals occur.

(2) Contrast Type B in word-initial (=2a) and postsonorant (=2b) position:

a.	[PA i...]	[PA ɑ...]	b.	[...i PA...]	[...ɑ PA...]
		[VE ɑ...]			[...ɑ VE...]

Phonemic palatal noncontinuants – as well as palatal noncontinuant quasi-phonemes – can arise the same way as their fricative counterparts. For example, an original velar like [k] (/k/) in the context of a front vowel can develop a palatal allophone ([c]) which is realized at a later stage as an underlying palatal (/c/) when the original front vowel trigger is eliminated by changes discussed in previous chapters (Vowel Reduction, Vowel Retraction, Syncope).

Many of the varieties discussed below have another quirk in common: Velar fronting can occur even when a segment intervenes between the target and trigger, e.g. the velar (/k/) after a front vowel plus liquid sequence (/il/) is realized as palatal ([ilc]), but the velar remains a velar if a back vowel precedes the liquid (/ɑlk/⟶[ɑlk]). Recall from Chapter 6 that example like these is also attested in two HstAlmc varieties. It was argued in that chapter that velar fronting is fed by a change merging the coronal feature of a front vowel with the coronal feature of the liquid (Coalescence-1). A mirror-image process for word-initial position is shown to be active in some varieties as well.

In §11.2 I provide some general remarks on the status of velar noncontinuants as targets outside of the area investigated in the present chapter. In §11.3 and §11.4 I discuss those systems in MeWPo and Sil. The bulk of the material discussed below is devoted to a description and brief analysis of those varieties once spoken in East Pomerania and Posen (§11.5) and East Prussia (§11.6). A summary of the findings and the relevance for palatalization typology is presented in §11.7. In §11.8 I discuss the extension of velar fronting targets historically in the rule generalization model and the connection between the development of palatal noncontinuants and the existence of Slavic loanwords containing sounds phonetically similar to [c ɟ ɲ]. In §11.9 I consider the areal distribution of German dialects with a broader set of targets. I provide a brief conclusion in §11.10.

11.2 General remarks on velar noncontinuants as targets

The set of targets for velar fronting in all German dialects discussed in previous chapters consists of velar fricatives only. That /k g ŋ/ do not have palatal allophones in the neighborhood of front vowels is also implicit in the literature on MoStGm, although that presupposition is rarely stated explicitly.

In some of the late nineteenth and early twentieth century descriptive work on German dialects, velar noncontinuants like [k] and [ŋ] are described as having palatal variants in the neighborhood of front vowels, even in regions outside of the ones investigated below. I make no attempt to document the kind of grammar referred to here. Instead, I cite one representative example (NLGm), namely Greetsiel in the far western part of the German state of Lower Saxony (Niedersachsen; Hobbing 1879; Footnote 4.1). Hobbing's work is an articulatory phonetic description of the consonants and vowels in which he states (p. 24) clearly that [k] can have two articulations (reflected in two distinct symbols): ⟦k^1⟧ in the neighborhood of front vowels and ⟦k⟧ in the neighborhood of back vowels.

It is difficult to know with certainty whether or not the palatal stop ⟦k^1⟧ is phonological ([c] as an allophone of /k/ created by velar fronting) or simply the byproduct of phonetics, i.e. a prevelar which is the a consequence of coarticulation. I assume here that the latter is the correct interpretation, although it would be also consistent with the theme of this book to analyze ⟦k^1⟧ as phonological. Thus, I assume that the fronted realization of [k] in dialects like Greetsiel is a phonetic variant on par with the fronted [k] in English words like *keep*. I speculate that Hobbing as well as many of his contemporaries included the fronted realization of sounds like [k] in their grammars is that there was no distinction at that time between phonetics (which was already well-established in late nineteenth century in Germany) and phonology (which did not yet exist). Since the concept of phonemes and allophones lay a number of years in the future, phonetically-trained linguists like Hobbing had no alternative but to treat the palatal realization of [k] on par with segments that are uncontroversially phonemes.

In contrast to dialects like Greetsiel, palatal noncontinuants in the dialects discussed below are phonological and not phonetic. The reason for my conclusion is that the segments in question display the same degrees of phonologization as the corresponding fricatives [ç ʝ] by occurring as palatal quasi-phonemes or even as contrastive sounds (phonemic palatals).

11.3 Mecklenburgish-West Pomeranian

Kolz (1914) describes a MeWPo variety spoken in the northwest corner of Landkreis Nordwestmecklenburg (Footnote 11.1). Kolz refers to his variety as the West Mecklenburg dialect (‘Westmecklenburgischer Dialekt’).

The dorsal consonants of West Mecklenburg are listed in (3a) and (3b) for word-initial and postsonorant position respectively. Kolz adopts a wide array of phonetic symbols and diacritics expressing laryngeal distinctions. The relevant symbols for velars and palatals are [x ɣ]=⟦x g⟧, [ç ʝ]= ⟦χ g⟧, [k g]= ⟦k g⟧, [c ɟ]= ⟦c g⟧. The lenis palatal fricative [ʝ] is transcribed in two ways depending on the etymological source: ⟦g⟧<WGmc ⁺[ɣ] and ⟦j⟧<WGmc ⁺[j]. [ŋ] and [ɲ] are both rendered as ⟦ꞥ⟧.

(3) a.

/ʝ/	/k/		/g/	/ɟ/
[ʝ]	[k]	[c]	[g]	[ɟ]

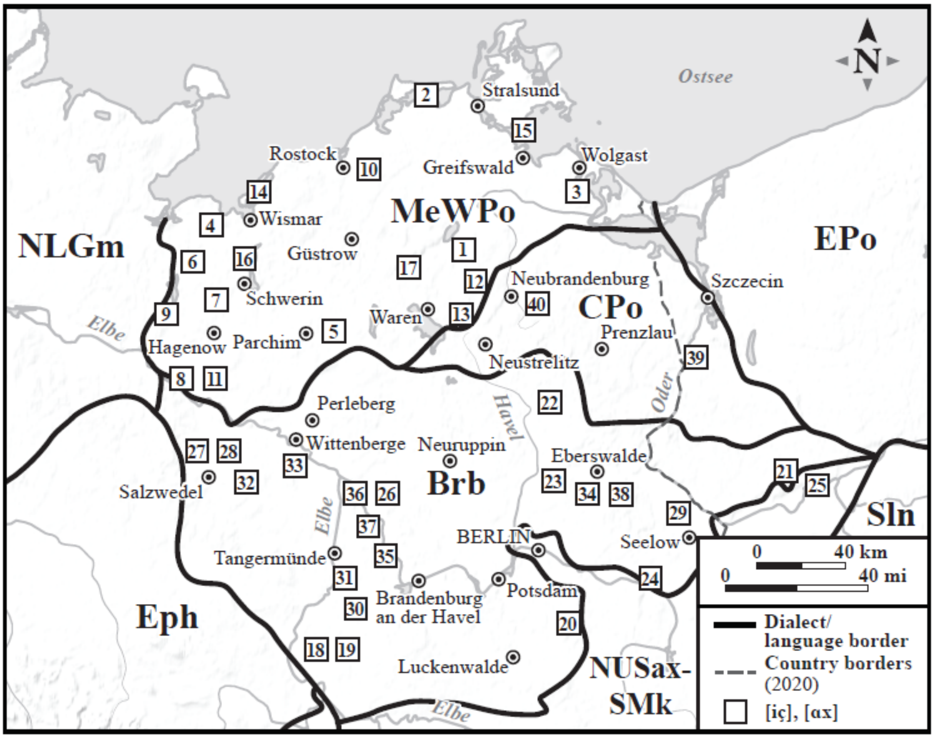
b.

/x/		/ɣ/		/k/	/c/	/g/		/ŋ/	
[x]	[ç]	[ɣ]	[ʝ]	[k]	[c]	[g]	[ɟ]	[ŋ]	[ɲ]

Consider first the stops [k c g ɟ] (<WGmc ⁺[ɣ k]) in word-initial position. In that context the velars [k g] never contrast with the corresponding palatals ([c ɟ]): [k g] occur before a full back vowel (in 4a,e) or a consonant followed by a full back vowel (in 4b,f) and [c ɟ] before a front vowel (in 4c,g) or a consonant followed by a front vowel (in 4d,h). [k g] never occur before a front vowel or a consonant plus front vowel sequence. [ɟ] (<WGmc ⁺[ɣ]) also surfaces before schwa (in 4i) and [ʝ] (<WGmc ⁺[j]) before any vowel (in 4j).

(4) Word-initial dorsal obstruents:

a.	kus	[kʊs]	Kuss	‘kiss’	135
b.	krum	[krʊm]	krumm	‘bent’	127
	knuᵊdn	[knuədn̩]	Knorren	‘gnarl’	67
c.	cind	[cɪnt]	Kind	‘child’	17
d.	cli·f	[clif]	Klette	‘burr’	127
	cneχt	[cneçt]	Knecht	‘vassal’	28
e.	gɔ·bl	[gɔ·bl̩]	Gabel	‘fork’	129



Map 11.1: Mecklenburgish-West Pomeranian (MeWPo), Brandenburgish (Brb), and Central Pomeranian (CPo). Squares indicate postonorant velar fronting. 1=Holst (1907), 2= Schmidt (1912a), 3=Warnkross (1912), 4=Kolz (1914), 5=Jacobs (1925a), Jacobs (1925b), Jacobs (1926), 6=Teuchert (1927) (Rehna), 7=Teuchert (1927) (Schwerin), 8=Dützmann (1932), 9=Teuchert & Schmitt (1933) (Ratzeburg), 10=Teuchert & Schmitt (1933) (Rostock), 11=Teuchert & Schmitt (1933) (Lank), 12=Blume (1933), 13=Teuchert (1934), 14=Bethge & Bonnin (1969), 15=Prowatke (1973) (Greifswald), 16=Prowatke (1973) (Schwerin), 17-Schönfeld (1989) (Teterow), 18=Krause (1895), 19=Krause (1896), 20=Siewert (1907), 21=Teuchert (1907b), Teuchert (1907c), 22=Teuchert (1907a), 23=Seelmann (1908), 24=Siewert (1912), 25=Seelmann (1913), 26=Hildebrand (1913), 27=Selmer (1918), 28=Götze (1922), 29=Teuchert (1930), 30=Bathe (1932), 31=Bathe (1937), 32=Törnqvist (1949), 33=Bretschneider (1951), 34=Teuchert (1964), 35=Bathe (1965), 36=Gebhardt (1965), 37=Schönfeld (1965), 38-Schönfeld (1989) (Tempelfelde), 39=Brose (1955), 40=Prowatke (1973).

f.	gram	[gram]	böse	'angry'	124
	gna·dn	[gnadn̩]	knarren	'creak-INF'	59
g.	gelt	[ɟelt]	Geld	'money'	27
h.	glīnt	[ɟliːnt]	Lattenzaun	'picket fence'	21
i.	gəsiχt	[ɟəsɪçt]	Gesicht	'face'	17
j.	juʀk	[jʊŋk]	jung	'young'	15

After a sonorant, velar fricatives ([x ɣ]) and their palatal counterparts ([ç ʝ]) are allophones: The velars occur after a back vowel (in 5a,e) and the palatals after a front vowel (in 5c,f). [x] also occurs after a liquid preceded by a back vowel (in 5b) and [ç] after a liquid preceded by a front vowel (in 5d). No parallel example like (5d) was found for [ʝ]. Velar stops ([k g]) and their palatal counterparts ([c ɟ]) display a parallel distribution (in 5g-n).[3] The dorsal sounds referred to above ([x ç ɣ ʝ k c g ɟ]) are all modern reflexes of velars (WGmc $^+$[ɣ k] or $^+$[gg]). The items in (5o,p) show that nasal plus stop sequences (<WGmc $^+$[ŋk]) are homorganic. After a front vowel, the nasal and stop are palatal, and after a back vowel they are both velar; the distinction between the two nasals in examples like these is clear from the original source (Kolz 1914: 147): "as ʀ vor gutturalem Verschlusslaut ... ist ... erhalten als palatales ʀ vor palatalem, als velares ʀ vor velarem Verschlusslaut". ['Old Saxon ʀ ... is palatal ʀ before palatal stops and velar ʀ before velar stops'.] The [c] in (5q) occurs in the context after a historically elided front vowel (by Syncope; recall Chapter 7).

(5) Postsonorant dorsal consonants:

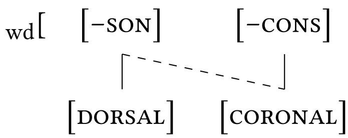
a.	tuxt	[tʊxt]	Zucht	'breeding'	68
b.	talx	[talx]	Talg	'tallow'	52
c.	liχt	[lɪçt]	Licht	'light'	15
d.	fel·χ	[felç]	Felge	'wheel rim'	27
e.	fogl	[fɔɣl̩]	Vogel	'bird'	15
f.	flɛ·gl	[flɛ·ʝl̩]	Flegel	'boor'	15
g.	rók	[rok]	Rauch	'smoke'	127

[3] The velar stop [g] in (5k,l) and the palatal stop [ɟ] in (5n) are followed by the (syllabic) velar nasal [ŋ] and the (syllabic) palatal nasal [ɲ] respectively. Examples like these suggest that the place features of a syllabic nasal spread from the place features of a preceding obstruent (Progressive Nasal Place Assimilation). Since that process is independent of velar fronting it is not discussed here; see Hall (2020), who shows that Progressive Nasal Place Assimilation is active in several WGmc languages.

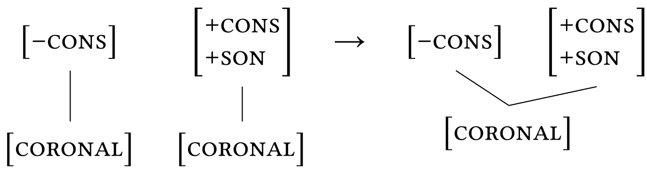
h.	kɑlk	[kɑlk]	Kalk	‘lime’	45
i.	dic	[dɪc]	dick	‘fat’	17
j.	melc	[melc]	Milch	‘milk’	24
k.	bɑgʀ	[bɑgŋ̇]	backen	‘bake-INF’	43
l.	bɑlgʀ	[bɑlgŋ̇]	Balken	‘beam’	53
m.	egᵊ	[eɟə]	Egge	‘harrow’	28
n.	mėlgʀ	[mɛlɟɲ̇]	melken	‘milk-INF’	35
o.	diʀc	[dɪɲc]	Ding	‘thing’	125
p.	lɑʀc	[lɑŋk]	lang	‘long’	125
q.	v́ɛdc	[vɛdc]	Enterrich	‘gander’	33

The initial stops in (4a-h) are underlying velars (/k g/), which surface as the corresponding palatals before a front vowel (in 4c,g) by the specific version of velar fronting stated in (6). In (4d,h), the [coronal] feature of the front vowel and the [coronal] feature of the preceding sonorant consonant undergo (7b), which feeds (6), e.g. /gliːnt/⟶|g**li**ːnt|⟶[ɟ**li**ːnt], where the segments in bold reflect the application of (7b) and (6). The word-initial consonant in (4i) is a palatal quasi-phoneme (/ɟ/), and in (4j) it is the etymological palatal (/j/).[4]

(6) Wd-Initial-Velar Fronting-6:

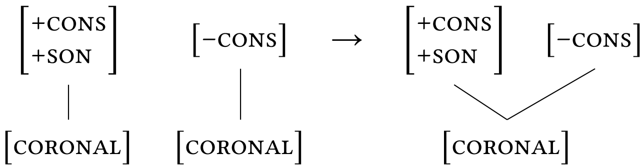


(7) a. Coalescence-1:



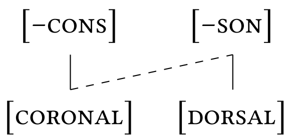
b. Coalescence-2:

[4]As stated in (7b) the leftmost segment of Coalescence-2 is a coronal sonorant consonant, e.g. the /l/ in [ɟliːnt] ‘picket fence’ (from 4h). Data not presented above show that (6) also affects a word-initial velar before the labial [v], e.g. [cveə] ‘across’ (from /kveə/). I do not discuss this complication here; see §12.8.1.



All postvocalic palatals in (5) derive from the corresponding velars by the mirror-image of (6) stated in (8). If the target sound (/x ɣ k g/) follows a liquid, then it surfaces as the corresponding palatal if the vowel preceding the liquid is front, otherwise it is velar (cf. 5b vs. 5d; 5h vs. 5j; 5l vs. 5n); recall Visperterminen and Obersaxen (Chapter 6). Front vowel plus liquid sequences in (5d,j,n) share [coronal] by Coalescence-1 (=7a). That merged [coronal] feature spreads to a following velar by Velar Fronting-8, thereby creating a palatal. In postvocalic nasal plus stop clusters (in 5o,p) the sequence (/ŋk/) has a single place feature dominating [dorsal]. If the vowel preceding /ŋk/ is front then [coronal] spreads from that vowel to the right by Velar Fronting-8, e.g. /dɪŋk/⟶[dɪ**ɲc**]. The final segment in (5q) is an underlying palatal (quasi-phoneme), i.e. /c/.

(8) Velar Fronting-8:



Kolz's variety of West Mecklenburg is unique for its region in more than one way. First, the target segments for all fronting operations consist of velar consonants, but the corresponding targets in neighboring places are restricted to one (/x/) or two (/x ɣ/) velar fricatives. Second, velar fronting word-initially and after a sonorant is fed by one of the coalescence processes, but in all but one of the sources discussed here, coalescence is absent. Third, there are underlying palatal stops (quasi-phonemes) in West Mecklenburg, but such palatals are absent in the dialects discussed below. I conclude this section by discussing briefly the status of velar fronting in some of the other places in the MeWPo region. All of these places are indicated on Footnote 11.1.

Consider first Teuchert's (1927) phonetic transcriptions of native speakers from two places close geographically to the area investigated by Kolz (1914), namely Rehna and Schwerin. On the basis of the material in Teuchert (1927) it can be safely concluded that coronal sonorants are the triggers for postsonorant fronting and that /x/ is the sole target for (postsonorant) velar fronting. Velar fronting does not occur word-initially. Significantly, neither of those two texts in Teuchert

(1927) indicate that noncontinuants undergo velar fronting. The same generalizations hold for the phonetic transcriptions of native speakers from Ratzeburg, Rostock, and Lank from Teuchert & Schmitt (1933).

None of the other sources for MeWPo indicate that velar noncontinuants serve as targets for velar fronting: In a series of detailed studies, Jacobs (1925a), Jacobs (1925b), Jacobs (1926) investigates the dialects spoken in the south of Mecklenburg-Vorpommern ("South Mecklenburg") between Lübz and Hagenow (§10.6.2; §12.7.1). Jacobs (1925b) presents copious data indicating that the set of targets for velar fronting is the velar fricative [x] (<WGmc +[x ɣ]), e.g. [vɛç] 'path' (=⟦vȩχ⟧), [væːç] 'paths'(=⟦vā̈χ⟧) vs. [tʊxt] 'breeding' (=⟦tu̜xt⟧), [oːx] 'eye' (=⟦ōx⟧), but there is no indication in that source that [k g] have palatal variants after front vowels.[5] That /x/ is the only target for velar fronting is clear in descriptions of Ivenack-Stavenhagen (Holst 1907), e.g. [bryç] 'bridge' (=⟦brüχ⟧) vs. [nɔx] 'still' (=⟦nox⟧) and Wolgast (Warnkross 1912), e.g. [brøːç] 'bridge' (=⟦brȫ̂χ⟧) vs. [dox] 'day' (=⟦dox⟧). Neither Holst (1907) nor Warnkross (1912) mention a fronted realization of [k g ŋ].[6]

Among the dialects discussed in the preceding paragraph South Mecklenburg (Jacobs 1925a, Jacobs 1925b, Jacobs 1926) is the only one in which Coalescence-1 is clearly not active, cf. [fɛlx] 'wheel rim' (=⟦fȩl̄x⟧). That type of example is not mentioned in Holst (1907) or Dützmann (1932) and therefore one cannot know for certain whether or not Coalescence-1 is present. By contrast, Wolgast is a dialect with Coalescence-1, cf. [balx] 'brat' (=⟦bɑlx⟧) vs. [telç] 'branch'(=⟦telχ⟧).[7] Finally, none of the sources cited above appears to have palatal quasi-phonemes.

Velar noncontinuants do not serve as targets for velar fronting in those NLGm varieties spoken in Lower Saxony or Schleswig-Holstein which border West Mecklenburg. The closest of those dialects to West Mecklenburg for which a source is available is the NLGm variety of Hemmelsdorf (Pühn 1956; Footnote 4.1), but that source is clear that the sole target for velar fronting is /x/, e.g. [knɛç] 'vassal' (=⟦knȩχ⟧) vs. [hoːx] 'high' (=⟦hōx⟧) and that velar stops and the velar nasal surface without change even after front vowels. The same point holds for the

[5] A brief statement can be found in Jacobs (1925a: 47) asserting that [ŋ] has a fronted variant after a front vowel, though that type of example is not discussed further.

[6] The velar fronting targets in Kaarβen (Dützmann 1932) are /x ɣ/, e.g. [nɪç] 'not' (=⟦ni̜χ⟧), [zœːʝ] 'sow' (=⟦zœ̂ːɣ⟧) vs. [lɑxn̩] 'laugh-INF' (=⟦lɑxn̩⟧), [dɑoɣ] 'day' (=⟦då̂oːɣ⟧). (⟦ɣ⟧ represents either velar [ɣ] or palatal [ʝ]). Dützmann (1932: 12) has palatal and velar stops as well as palatal and velar nasals, but he does not discuss the distribution of those sounds. The same point holds for Barth (Schmidt 1912a), where /x/ is the sole target for fronting, e.g. [tyːç] 'stuff' (=⟦tȳç⟧) vs. [oːx] 'eye' (=⟦ōx⟧).

[7] That type of example might also be attested in Barth: Schmidt (1912a) mentions [felç] 'wheel rim' (=⟦felç⟧). However, no examples in that source have a back vowel followed by /lx/.

NLGm variety of Kreis Herzogtum Lauenburg (Heigener 1937; Footnote 4.1), e.g. [lɪçt] 'light' (=⟦licd⟧) vs. [ɑxt] 'eight' (=⟦ɑχd⟧), and (NLGm) Bleckede (Rabeler 1911; Footnote 4.1), e.g. [gəziçt] 'face' (=⟦gəzixd⟧) vs. [hoːx] 'high' (=⟦ʿōχ⟧). No examples were found in any of the aforementioned sources for words consisting of a back vowel plus liquid followed by /x/ which could potentially shed light on whether or not a Coalescence-1 is active. Likewise no palatal quasi-phonemes were found in any of the sources cited above.

11.4 Silesian

Meiche (1898) describes the Sln variety of Sebnitz (Footnote 5.2). The patterning of dorsal consonants is depicted in (9).

(9)

a.	/ɟ/	/k/	/c/	/k^{h}/		/ŋ/		
	[ɟ]	[k]	[c]	[k^{h}]	[c^{h}]	[ŋ]	[ɲ]	
b.	/x/	/ç/	/k/		/k^{h}/		/ŋ/	
	[x]	[ç]	[k]	[c]	[k^{h}]	[c^{h}]	[ŋ]	[ɲ]

Meiche refers to the lenis and fortis contrast among stops in terms of aspiration, which is the way in which I transcribe the difference between lenis and fortis sounds, e.g. ⟦g⟧ and ⟦k⟧ are transcribed below as [k] and [k^{h}] respectively. An added complication not discussed here is that the aspirated sounds (e.g. [k^{h}]) only occur initially before vowels but not before consonants. Palatal stops are rendered in the original source either with separate symbols or with diacritics making them distinct from the corresponding velars, e.g. [c c^{h}] =⟦gˊ c⟧ and [ɟ ç]=⟦j χ⟧. [ɲ] and the [ŋ] are transcribed as ⟦ŋ⟧ and ⟦ʁ⟧ respectively.

In word-initial position velars never contrast with the corresponding palatals: [k k^{h}] (<WGmc $^{+}$[ɣ k]) occur before a full back vowel (in 10a,e) or a liquid followed by a full back vowel (in 10b), and [c c^{h}] before a front vowel (in 10c,f) or a liquid followed by a front vowel (in 10d). The examples in (10g,h) illustrate that the original nasal (WGmc $^{+}$[n]) has undergone Wd-Initial Nasal Place Assimilation (in 1a). The derived velar sequence ([kŋ]<WGmc $^{+}$[kn]) surfaces as velar if a back vowel follows those clusters (in 10g) and as palatal if a front vowel follows (in 10h). [c] (<WGmc $^{+}$[ɣ]) surfaces before schwa (in 10i) and [ɟ] (<WGmc $^{+}$[j]) before any vowel (in 10j).

(10) Word-initial dorsal consonants:

a.	gα̊st	[kɑst]	Gast	‘guest’	88
b.	glɒs	[klɒs]	Glas	‘glass’	88
c.	gˊȩdər	[cɛtər]	Götter	‘gods’	43
d.	gˊlygˊə	[clʏcə]	Glück	‘fortune’	45
e.	kū	[kʰuː]	Kuh	‘cow’	90
f.	cȩnər	[cʰɛnəʀ]	keiner	‘none-MASC SG’	90
g.	gʀɑdṇ	[kŋɑːtṇ]	kneten	‘kneed-INF’	90
h.	gˊηīə	[cɲiːə]	Knie	‘knee’	91
	gˊηα˙ χt	[cɲæːçt]	Knecht	‘vassal’	90
i.	gˊəbūrt	[cəpuːʀt]	Geburt	‘birth’	88
j.	jumər	[ʝʊməʀ]	Jammer	‘lament’	31

Velar vs. palatal contrasts are also absent in postsonorant position. In that context [x] surfaces after back vowels (in 11a) and [ç] after front vowels (in 11b) or coronal sonorant consonants (in 11c,d). Example (11d) exemplifies a difference from West Mecklenburg (cf. 5b vd. 5d). However, the same conclusion cannot be drawn concerning the distribution of velar and palatal stops: [k kʰ] occur after a back vowel (in 11e,i) or after a liquid preceded by a back vowel (in 11f,j) and the corresponding palatals [c cʰ] after a front vowel (in 11g,k) or a liquid preceded by a front vowel (in 11h). The data in (11l,m) illustrate the patterning of the velar nasal and the palatal nasal is precisely as in West Mecklenburg (cf. 5o,p). Many of the examples containing [ç] listed in the original source occur after a historically elided front vowel (in 11n via Syncope) or after the historical coronal rhotic /r/ (in 11o via r-Retraction, recall Chapter 7). The dorsal consonants referred to in the present paragraph derived historically from velars (WGmc ⁺[x ɣ k]). The syllabic nasal in (11d,h) is the product of Progressive Nasal Place Assimilation (Map 3).

(11) Postsonorant dorsal consonants:

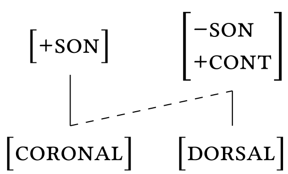
a.	nɑxt	[nɑxt]	Nacht	‘night’	27
b.	hɑχt	[hæçt]	Hecht	‘pike’	57
c.	milχ	[mɪlç]	Milch	‘milk’	37
d.	gα̊lχη	[kɑlçɲ̍]	Galgen	‘gallows’	88
e.	flugs	[flʊks]	flugs	‘quickly’	88
f.	fα̊lgə	[fɑlkə]	Falke	‘falcon’	29

g.	dyg΄ə	[tʏcə]	dick	‘fat’	91
	undərwāg΄s	[untəʀvæːcs]	unterwegs	‘underway’	88
h.	malg΄η	[mælcɲ̍]	melken	‘milk-INF’	35
i.	sak	[saːkʰ]	Sack	‘sack’	91
j.	fulk	[fʊlkʰ]	Volk	‘people’	91
k.	dra˙ c	[dʀæːcʰ]	Dreck	‘dirt’	91
l.	zwaʁk	[tsvaŋkʰ]	Zwang	‘compulsion’	91
m.	diηc	[tɪɲcʰ]	Ding	‘thing’	91
n.	kafχ	[kaːfç]	Käfig	‘cage’	34
o.	mårχt	[maʀçt]	Markt	‘market’	91

For word-initial position, palatal stops ([c cʰ]) in pre-vocalic position (=10c,f) derive from the corresponding velars (/k kʰ/) by Wd-Initial Velar Fronting-6. Coalescence-2 merges the [coronal] feature of the front vowel and the preceding liquid (in 10d), and the fronting of the velar preceding that liquid is accomplished with Wd-Initial Velar Fronting-6, e.g. /klʏcə/⟶|k**lʏ**cə|⟶[c**lʏ**cə]. The homorganic nasal plus stop sequences in (10g,h) have a single [dorsal] feature (/kŋ/). If /kŋ/ is followed by a front vowel, then the feature [coronal] spreads to the left by Wd-Initial Velar Fronting-6, e.g. /kŋiːə/⟶[c**ɲiː**ə]. The initial consonant in (10i,j) is an underlying palatal, i.e. the palatal quasi-phoneme /c/ in (10i, and the etymological palatal /j/ in (10j).

After a front vowel (in 11b,g,k), palatal stops and fricatives derive from velars (/x k kʰ/) by Velar Fronting-8, and after a back vowel those velars surface without change as [x k kʰ] (in 11a,e,i). If a front vowel is followed by a liquid (in 11c,h) then Coalescence-1 applies, e.g. /mɪlx/⟶|m**ɪl**x|; /mælkŋ̍|⟶|m**æl**kŋ̍|. If the liquid is preceded by a back vowel (in 11d) then the feature [coronal] from the liquid spreads to /x/ by Velar Fronting-1 (in 12), e.g. /kalxŋ̍/⟶|ka**lç**ŋ̍|. Since the target for (12) is a velar fricative, spreading occurs in (11d) but not in (11f,j), e.g. e.g. /fʊlkʰ/⟶[fʊlkʰ]. The merged [coronal] feature in (11c,h) spreads to the following velar by either Velar Fronting-1 (in 12) or Velar Fronting-8, thereby creating a palatal.

(12) Velar Fronting-1:



Nasal plus stop clusters in (11l,m) bear a single [dorsal] feature in the underlying representation. If a front vowel precedes that cluster (in 11m) then the feature [coronal] of the front vowel spreads to the left by Velar Fronting-8, thereby creating [ɲc^h]. [ç] in (11n,o) is an underlying palatal (quasi-phoneme), i.e. /ç/.

Michel (1891) describes the Sln variety of Seifhennersdorf (Footnote 5.2). That dialect possesses velar and palatal fricatives [x ɣ] (=⟦χ ʒ⟧) and [ç ʝ] (=⟦ȷ j⟧), velar and palatal stops [k^h k] (=⟦kh k⟧) and [c^h c] (=⟦ch c⟧), the velar nasal [ŋ] (=⟦ʁ⟧), and the palatal nasal ([ɲ]=⟦ŋ⟧). The distribution of those sounds is illustrated in (13).[8]

(13)

a.	/ʝ/	/k/	/c/	/k^h/		/ŋ/		
	[ʝ]	[k]	[c]	[k^h]	[c^h]	[ŋ]	[ɲ]	
b.	/x/	/ç/	/ɣ/		/k/		/ŋ/	
	[x]	[ç]	[ɣ]	[ʝ]	[k]	[c]	[ŋ]	[ɲ]

Velars never contrast with the corresponding palatals. In word-initial position [k^h k] occur before a full back vowel (in 14a,e) or a consonant followed by a full back vowel (in 14b) and [c^h c] before a front vowel (in 14c,f) or a consonant followed by a front vowel (in 14d).[9] The stops referred to here ([k^h k c^h c]) derived from historical velars (WGmc +[ɣ k]). A stop plus nasal sequence (<WGmc +[kn] via Wd-Initial Nasal Place Assimilation in 1a) surfaces as velar before a back vowel (in 14g) and palatal before a front vowel (in 14h). Palatal [c] (<WGmc +[ɣ]) occurs before schwa (in 14i) and [ʝ] (<WGmc +[j]) before any vowel (in 14j).

(14) Word-initial dorsal obstruents:

a.	kut	[kʊt]	gut	'good'	57
b.	klạs	[klɑs]	Glas	'glass'	7

[8] In his description of the neighboring dialect spoken in Groβschönau (see below), Wenzel (1919: 2–3) refers to the dialect spoken in Seifhennersdorf as "de[m] merkwürdigsten aller Dialekte der Oberlausitz". ['The most peculiar of all dialects of the Oberlausitz"]. At the time he wrote those words (1919) he considered both Seifhennersdorf and Sebnitz to be already archaic ["bereits historisch"].

[9] Most of Michel's examples belonging to category (14d) have [i] after the liquid. In some of his data the initial sound is transcribed as velar (⟦k⟧) if the post-liquid vowel is nonhigh, e.g. [knæçt] 'vassal' (=⟦knɑχt⟧). It is therefore possible that the set of triggers for the process of word-initial velar fronting described below consists of nonhigh front vowels.

c.	cęstɑn	[cɛstɐn]	gestern	'yesterday'	57
d.	cliŋcĕ	[clɪɲcə]	Klinke	'handle'	50
e.	khɑlt	[kʰɑːlt]	kalt	'cold'	55
f.	chind	[cʰɪnt]	Kind	'child'	55
g.	kʁoutn	[kŋoutn̩]	Knoten	'node'	13
h.	cŋī	[cɲiː]	Knie	'knee'	20
i.	cĕbūrt	[cəpuːrt]	Geburt	'birth'	11
j.	ĭumɑ	[ɟʊmɐ]	Jammer	'lament'	42

In postsonorant position [x ɣ] occur after back vowels and [ç ʝ] after front vowels or coronal sonorant consonants (in 15a-g). [x ɣ ç ʝ] in these examples derive from historical velars (WGmc $^{+}$[x k ɣ]). [k] and [c] have a distribution that mirrors their fricative counterparts (in 15h-j). On the basis of (15d,g,j) it can be deduced that Coalescence-1 is not active in the phonology of Seifhennersdorf. The dorsal stops ([k c]) in (15h-j) derived from etymological velars (WGmc $^{+}$[ɣ k] or $^{+}$[gg]). The clusters [ŋk ɲc] (<WGmc $^{+}$[ŋk]) surface after back vowels and front vowels respectively (in 15k,l). Example (15m) indicates that [ç] (<WGmc $^{+}$[ɣ]) is also present after a historically elided front vowel (by Syncope).

(15) Postsonorant dorsal consonants:

a.	woχĕ	[vɔxə]	Woche	'week'	56
b.	hɑȷet	[hæçt]	Hecht	'pike'	6
c.	mylȷ	[mʏlç]	Milch	'milk'	46
d.	molȷ	[mɔlç]	Molch	'newt'	46
e.	ouʒĕ	[ouɣə]	Auge	'eye'	57
f.	ęjĕ	[ɛʝə]	Egge	'harrow'	57
g.	foljĕ	[fɔlʝə]	Folge	'consequence'	58
h.	pflūk	[pfluːk]	Pflug	'plow'	57
i.	mycĕ	[mʏcə]	Mücke	'mosquito'	57
j.	khɑ̦lc	[kʰɑlc]	Kalk	'lime'	45
k.	fɑ̦ʁk	[faŋk]	fang	'caught-IMP SG'	6
l.	tiɲc	[tɪɲc]	Ding	'thing'	50
m.	chęfȷ	[kʰɛfç]	Käfig	'cage'	42

For word-initial position, palatal stops in pre-vocalic position (in 14c,f) derive synchronically from the corresponding velars (/k k^h/) by Wd-Initial Velar Fronting-6. In (14d) Coalescence-2 merges the [coronal] feature of the front vowel and the coronal feature of the preceding liquid, thereby feeding fronting, e.g. /klɪŋkə/→|**kl**ɪŋkə|→|**cl**ɪŋkə|. The nasal plus stop sequences in (14g,h) are underlying velar (/kŋ/). If the [dorsal] feature of /kŋ/ is followed by a front vowel, then its [coronal] feature spreads to the left by Wd-Initial Velar Fronting-6, e.g. /kŋiː/→[**cɲi**ː]. The word-initial consonants in (14i,j) are underlying palatals, i.e. /ɟ c/.

After a sonorant, palatals derive from velars by Velar Fronting-9 (in 16). Given the broad set of triggers (i.e. coronal sonorants), (16) spreads [coronal] from a front vowel (in 15b,f,i) or liquid (in 15c,g,j) to a following velar (/x ɣ k/). In examples (15k,l) the nasal stop clusters (/ŋk/) bear one [dorsal] feature. If a front vowel precedes that cluster (in 15l) then the feature [coronal] of that front vowel spreads to the right by (16), e.g. /tɪŋk/→[tɪ**ɲc**]. The final segment in (15m) is an underlying palatal (quasi-phoneme), i.e. /ç/.

(16) Velar Fronting-9:

[+son] [+cons]

[coronal] [dorsal]

Note the difference between Seifhennersdorf and Sebnitz: In the former variety, palatals derive from velars after front vowels and sonorant consonants alike. However, in Sebnitz the choice of velar vs. palatal is determined by the vowel preceding the liquid, but only in the case of palatal stops (recall 11h,j), but not palatal fricatives (recall 11c,d).

Like West Mecklenburg, the two Sln varieties described above are unique in more than one way. In particular, none of the neighboring communities are reported to have velar noncontinuants as targets for velar fronting. The Sln variety closest geographically to Sebnitz and Seifhennersdorf for which a description is available is Wenzel (1919) (Footnote 5.2; recall Map 8). It is clear from that source that the set of targets for velar fronting consists solely of /x/ and that velar noncontinuants do not have palatal realizations, e.g. [lɪçt] 'light' (=⟦liχt⟧) vs. [lɑxŋ̍] 'laugh-INF' (=⟦lɑχʁ⟧). The original sources for the USax varieties spoken in Schokau (Pompé 1907; Footnote 7.2) and the broad area in West Lausitz (Protze 1957; Footnote 7.2) devote considerable discussion to the phonetics of consonants and vowels. It is clear from both sources that the sole target for velar fronting is

/x/ but that velar noncontinuants do not have a palatal realization. No examples were found in any of the aforementioned sources for words consisting of a back vowel plus liquid followed by /x/ which could potentially shed light on whether or not Coalescence-2 is active.

Sln dialects not immediately adjacent to Sebnitz and Seifhennersdorf are not reported to have noncontinuants as targets for velar fronting either. See in particular the varieties referred to in §5.3.2 (Footnote 5.2), namely Kreis Jauer (Halbsguth 1938), Kieslingswalde (Kreis Habelschwerdt; Pautsch 1901), and the supraregional Sln dialect described by von Unwert (1908).[10]

11.5 East Pomeranian

Mischke (1936) describes the EPo dialects spoken once in Kreis Bütow and Kreis Rummelsburg, which I consider in that order (Footnote 11.2). The synchronic distribution of dorsal consonants in Kreis Bütow is depicted in (17).

(17) a.

/ɣ/	/ʝ/	/x/	/k/	
[ɣ]	[ʝ]	[x]	[k]	[c]

b.

/x/		/ɣ/		/k/		/g/		/ŋ/	/ɲ/
[x]	[ç]	[ɣ]	[ʝ]	[k]	[c]	[g]	[ɟ]	[ŋ]	[ɲ]

[x] surfaces word-initially before a consonant (in 18a), but not before a vowel. [ɣ] and [ʝ] in (18b-d) exemplify (2a). The vowel [ɑːi] in (18c) was historically front (cf. OSax *giotan*). An example of a [ɣ]~[ʝ] alternation is listed in (18e). The initial segment in (18a-e) derived historically from a velar (WGmc ⁺[ɣ]). Palatal [ʝ] (<WGmc ⁺[j]) occurs before any type of vowel (in 18f). Word-initial dorsal stops ([k c]) stand in an allophonic relationship: [k] (=⟦k⟧) surfaces before back vowels or consonants (in 18g) and [c] (=⟦k´⟧) before front vowels (in 18h). No data are given for a word beginning with a dorsal stop followed by a liquid plus front vowel; hence, it cannot be determined if Coalescence-2 is active. The formal rule

[10] SchlSA makes no reference to palatal noncontinuants either. For example, on Map 51 for *kein* 'none', all of the realizations begin with the velar [k] (cf. 10f with [c]). In the introduction to that atlas the list of consonants (p. 5) includes palatal fricatives (both lenis and fortis), but only velar stops. In a separate chart on the same page there is a symbol for a palatalized ('palatalisiert[e]') velar nasal, but no tokens with that segment were found in the maps.

of fronting of velars in word-initial position (see below) is triggered by all front vowels in contrast to the fronting process in neighboring Kreis Rummelsburg.

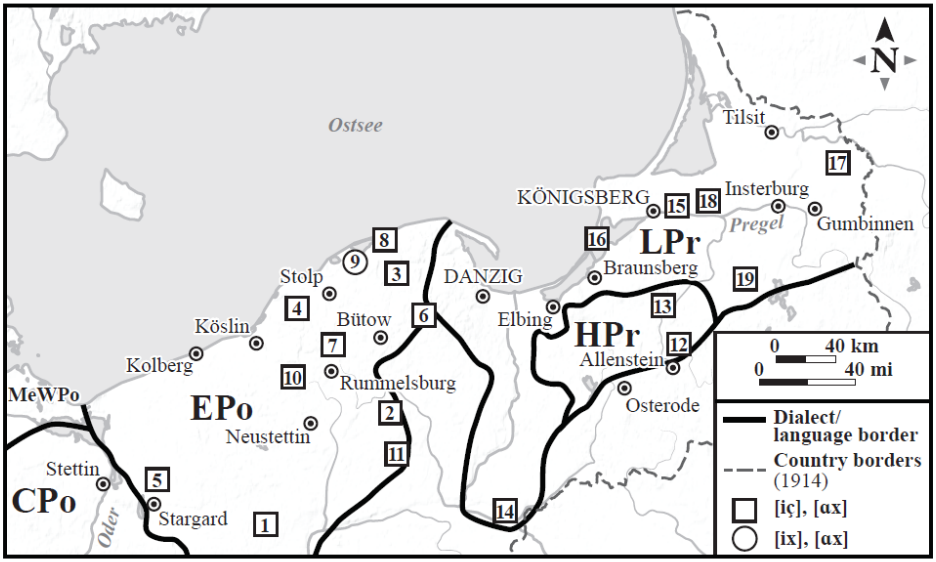
(18) Word-initial dorsal fricatives:

a.	xrɑf	[xrɑf]	Grab	'grave'	39
	xlįk	[xlɪk]	Glück	'fortune'	39
	xnōuʒə	[xno:uɣə]	nagen	'gnaw-INF'	39
b.	ʒɑųt	[ɣɑ:ut]	gut	'good'	39
	ʒųlt	[ɣʊlt]	Gold	'gold'	39
c.	jɑįtə	[ɟɑ:itə]	gießen	'water-INF'	39
d.	jįrtl	[ɟɪrtl̩]	Gürtel	'belt'	39
e.	ʒå·	[ɣɑ·]	gehen	'go-INF'	64
	jiŋ	[ɟiŋ]	ging	'went-PRET'	64
f.	jo·pə	[ɟo·pə]	Joppe	'jacket'	40
	jā̈·kə	[ɟæ:kə]	jucken	'itch-INF'	40
g.	kōukə	[ko:ukə]	kochen	'cook-INF'	38
	kno·p	[kno·p]	Knopf	'button'	38
h.	k´i·k´ə	[ci·cə]	gucken	'look-INF'	38

In the context after a sonorant, velar obstruents do not contrast with the corresponding palatals. Thus, velars ([x ɣ k g]) surface after a back vowel (in 19a,c,f,i) and palatals ([ç ʝ c ɟ]) after a front vowel (in 19b,d,g,j) or coronal sonorant consonant (in 19e,h). The palatals and velars referred to in (19a-j) derive historically from velars (WGmc $^{+}$[x ɣ k]).

(19) Distribution of postsonorant dorsal fricatives:

a.	jūx	[ɟu:x]	euer	'your-PL'	26
	dǫxtə(r)	[dɔxtə(r)]	Tochter	'daughter'	12
b.	nįχ	[nɪç]	nicht	'not'	35
	flēχ	[fle:ç]	Floh	'flea'	24
	ā̈χ	[æ:ç]	stumpf	'blunt'	10
c.	būʒə	[bu:ɣə]	bauen	'build-INF'	26
d.	štījə	[ʃti:ʝə]	steigen	'climb-INF'	20
	lā̈jə	[læ:ʝə]	legen	'place-INF'	10
e.	mǫrjə	[mɔrʝə]	morgen	'tomorrow'	13
	bɑlχ	[bɑlç]	Balg	'brat'	48
f.	klɑųk	[klɑ:uk]	klug	'clever'	38



Map 11.2: East Pomeranian (EPo), Low Prussian (LPr), and High Prussian (HPr). Squares indicate postsonorant velar fronting, and the circle indicates no postsonorant velar fronting. 1=Teuchert (1913), 2=Semrau (1915a), Semrau (1915b), 3=Pirk (1928), 4=Mahnke (1931), 5=Kühl (1932), 6=Mischke (1936) (Kreis Bütow), 7=Mischke (1936) (Kreis Rummelsburg), 8=Stritzel (1937) (Kreis Lauenburg), 9=Stritzel (1937) (Kreis Stolp), 10=Tita 1921 [1965], 11=Darski (1973), 12=Kuck (1933), 13=Kuck & Wiesinger (1965), 14=Wagner (1912), 15=Mitzka (1919), 16=Mitzka (1922), 17=Natau (1937), 18=Bink (1953), 19=Tessmann (1966).

g.	ɑi̯k´	[ɑːic]	Eiche	‘oak tree’	38
h.	mälk´	[mælc]	Milch	‘milk’	38
i.	bɑgdə	[bɑgdə]	backte	‘baked-PRET’	39
j.	bi̯g´ə	[bɪɟə]	picken	‘pick-INF’	39
k.	tu̯ŋ	[tʊŋ]	Zunge	‘tongue’	15
	ɑŋəs	[ɑŋəs]	anders	‘different’	36
l.	bi̯ŋ´əl	[bɪɲəl]	Bengel	‘rascal’	32
m.	drɑŋ´k	[drɑɲc]	Trank	‘drink’	32

The distribution of [ŋ] (in 19k) and [ɲ] (in 19l,m) exemplifies Contrast Type B in (2b). Historical [nd] sequences shifted to [ŋ] via Gutturalization (in 1b), e.g. the second example under (19k). Historical [ŋ] surfaces as [ŋ] after a back vowel (in the first example in 19k) and as [ɲ] after a front vowel (in 19l). Palatal [ɲ] in (19m) was historically [ŋ] (cf. MoStGm [drɑŋk]).

The initial sound in (18c,f) is an underling palatal (/ʝ/). In all other examples in dataset (18) the leftmost sound is an underlying velar (/x ɣ k/) which surfaces as palatal before front vowels by Wd-Initial Velar Fronting-6. The postsonorant dorsal consonants in (19a-l) are underlyingly velar (/x ɣ k g ŋ/) which surface as palatal after a coronal sonorant by Velar Fronting-9. The postvocalic nasal plus stop sequence in (19m) is underlyingly palatal. Since the back vowel in that example was also etymologically back (cf. MHG *tranc*), the phonemicization of palatal /ɲ/ in that word was probably a consequence of analogy (§8.6.2), cf. [drɪŋkə] 'drink-INF' (=⟦dri̯ŋ´kə⟧).[11]

Consider now the patterning of dorsal obstruents in Kreis Rummelsburg (Mischke 1936; Footnote 11.2) in (20). Note that [g] is absent entirely. All instances of [g] in Kreis Bütow are realized as [k] in Kreis Rummelsburg, e.g. Kreis Bütow [bɑgdə] backte 'baked-PRET' (=19i) vs. Kreis Rummelsburg [bɑ:kdə] (=⟦bɑkdə⟧).

(20) a. /ɣ/ → [ɣ]; /ʝ/ → [ʝ]; /x/ → [x]
b. /x/ → [x], [ç]; /ɣ/ → [ɣ], [ʝ]

A significant difference between Kreis Bütow and Kreis Rummelsburg is that the former dialect possesses palatal noncontinuants (recall 17), but the latter does not. This point is clear in the description of the reflexes of MLG [k] in Mischke (1936: 38–39). For example, Mischke transcribes the Kreis Bütow realization of ⟦k´i·k´ə⟧ 'look-INF' in (18h) with palatal stops, but the same word is rendered with velar stops (⟦ki·kə⟧) in Kreis Rummelsburg. Likewise palatal [ɲ] in Kreis Bütow is absent in Kreis Rummelsburg, which is decidedly velar ('ausgesprochen guttural'; Mischke 1936: 32).

A second significant difference between Kreis Bütow and Kreis Rummelsburg is the set of triggers for postsonorant velar fronting. Kreis Rummelsburg has the phonemic monophthongs in Table 11.1. All phonemic vowels are included here with the exception of placeless schwa (/ə/). The three-way length distinction among certain vowels is ignored.

Among front vowels, /i i· i ɪ/ are [+high] and /e: e· ɛ æ: æ·/ are [−high]. Within both groups, the split is then made between [+tense] and [−tense]. In the [coronal, −high, +tense] category, [±low] distinguishes /e: e·/ from /æ: æ·/. Within each of the three [coronal, +tense] columns, length units distinguish the individual

[11] No words were found in the original source in which [ŋ] and [ɲ] alternate, although I consider that gap to be accidental. Examples in which Gutturalization (=1b) applies after a front vowel which could potentially feed velar fronting are apparently absent.

Table 11.1: Distinctive features for vowels (Kreis Rummelsburg)

	i i· i	ɪ	e e·	ɛ	æː æ·	uː u· u	ʊ	oː o·	ɔ	ɑː ɑ	aː a·
[coronal]	✓	✓	✓	✓	✓						
[dorsal]						✓	✓	✓	✓	✓	✓
[high]	+	+	−	−	−	+	+	−	−	−	−
[tense]	+	−	+	−	+	+	−	+	−	+	−
[low]			−		+					+	+

members. The same procedure assigns the features listed above to the [dorsal] vowels. It is demonstrated below that [±tense] is crucial in defining the set of triggers for postsonorant fronting.

Mischke (1936) lists seven diphthongs; the ones important for my treatment are the two ending in a front vowel, which he transcribes as ⟦ɑį ei⟧. Note that the second component of ⟦ɑį⟧ is rendered with the traditional symbol for a lax vowel, while the second part of ⟦ei⟧ with the traditional symbol for a tense vowel. I treat the second part of both diphthongs as phonologically [+tense] (=[ɑːi ei]) because the right edge of those diphthongs behave as [+tense] vowels. As in MoStGm, no word in Kreis Rummelsburg can end in a lax vowel. For example, there are words ending in [i·] but not [ɪ], e.g. [fri·] 'free' (=⟦fri·⟧); Mischke (1936: 20). Significantly, there are words ending in both [ei] and [ɑːi], e.g. [ʃnɑːi] 'snow' (=⟦šnɑį⟧), [dei] 'you-DAT SG' (=⟦dei⟧); Mischke (1936: 17, 20). The existence of words like those suggests that the second component of the diphthongs [ei] and [ɑːi] is phonologically [+tense].

The patterning of dorsal fricatives in word-initial position is the same as in the related variety of Kreis Bütow (recall 18). What is important is distribution of [x ɣ] and their palatal counterparts in postsonorant position. The following datasets demonstrate that the velars never contrast with the corresponding palatals. In (21) it can be seen that [ç] surfaces after a front [+tense] monophthong (in 21a) and [x] after a front [−tense] monophthong (in 21b) or a back vowel (in 21c). The historical reflex of the postvocalic dorsal fricatives in (21) and below is a velar sound (WGmc $^+$[ɣ x k]). Examples like [liçt] 'light' with a short front tense vowel [i] in (21a) are important because they show that the trigger for fronting is the tenseness feature and not a feature for length.

(21) [ç] and [x] (from /x/):

a. miːχt [miːçt] möchte 'would_like-3 SG' 15

	liχt	[liçt]	Licht	'light'	12
	flēχ	[fle:ç]	Floh	'flea'	24
	dre·χ	[dre·ç]	trocken	'dry'	40
	zæ̃̄χ	[zæ:ç]	Sau	'sow'	25
b.	ni̦x	[nɪx]	nicht	'not'	35
	mi̦xəl	[mɪxəl]	Michel	'(name)'	12
	tre̦xlə	[trɛxlə]	Trichter	'funnel'	35
c.	jūx	[ju:x]	euer	'your-PL'	26
	ru·x	[ru·x]	rauh	'rough'	26
	rōx	[ro:x]	Ruhe	'quiet'	23
	do̦xtə(r)	[dɔxtə(r)]	Tochter	'daughter'	12
	blå·x	[bla·x]	blau	'blue'	34
	šlɑx	[ʃlɑ:x]	schlackiges Wetter	'wet weather'	8

[ʝ] and [ɣ] have the same distribution as their fortis counterparts: [ʝ] occurs after a front [+tense] monophthong (in 22a) and [ɣ] after a back monophthong (in 22b). There are a number of gaps that I consider to be accidental, e.g. there are apparently no short front tense monophthongs before [ʝ] and no short back vowels before [ɣ].

(22) [ʝ] and [ɣ] (from /ɣ/):

a.	līȷə	[li:ʝə]	leihen	'lend-INF'	17
	bēȷə	[be:ʝə]	biegen	'bend-INF'	24
	bræ̃̄ȷə	[bræ:ʝə]	Gehirn	'brain'	19
b.	būʒə	[bu:ɣə]	bauen	'build-INF'	26
	kōʒə	[ko:ɣə]	kauen	'chew-INF'	23
	rōʒə	[ro:ɣə]	ruhen	'rest-INF'	23
	måʒə	[za:ɣə]	Magen	'stomach'	16
	ɑʒərə	[ɑ:ɣərə]	ärgern	'annoy-INF'	11

[ç] (/ɣ/) occurs after a [+tense] monophthong (in 23a) and [x] (/ɣ/) after a [−tense] monophthong (in 23b) or a back vowel (in 23c). [x ç] in these examples derives historically from a velar (WGmc +[ɣ]). As indicated in the first row of (23), I assume that /ɣ/ is the underlying sound for [x ç] in the synchronic phonology, although it is also possible that the original lenis sound (WGmc +/ɣ/) restructured to /x/ in those words where there is no longer a lenis alternant. Underlying /ɣ/ remains velar in (23b,c) and shifts to palatal in (23a) by the fronting rule I posit below. In both sets of examples, the underlying lenis sound undergoes Final Fortition in coda position.

(23) [ç] and [x] (from /ɣ/):

a.	fli·χt	[fli·çt]	Flügel	‘wing’	15
	ti·χ	[ti·ç]	Zeug	‘stuff’	27
	twi·ntiχ	[twintiç]	zwanzig	‘twenty’	12
	šte·χ	[ʃte·ç]	stieg	‘climbed-PRET’	41
b.	zęxt	[zɛxt]	sagt	‘says-3SG’	9
c.	dro·x	[dro·x]	trog	‘deceived-PRET’	40
	zåx	[zaːx]	Säge	‘saw’	16
	dɑx	[dɑx]	Tag	‘day’	8

Palatals occur after a diphthong whose second member is [+tense] (in 24a) and velars elsewhere (in 24b):

(24) Palatals (from /x ɣ/) after a diphthong:

a.	dɑįχ	[dɑːiç]	Teig	‘dough’	17
	tɑįjəl	[tɑːiʝəl]	Ziegel	‘clay brick’	18
	šteijə	[ʃteiʝə]	steigen	‘climb-INF’	20
b.	mį·əx	[mɪəx]	Mücke	‘mosquito’	40
	lį·əʒə	[lɪəɣə]	liegen	‘lie-INF’	40
	ę·əx	[ɛəx]	stumpf	‘blunt’	10
	lę·əʒə	[lɛəɣə]	legen	‘place-INF’	10
	bǫ·əx	[bɔəx]	Eber	‘boar’	13
	mǫ·əʒə	[mɔəɣə]	morgen	‘tomorrow’	13
	plɑųx	[plɑːux]	Pflug	‘plow’	22

After a coronal sonorant consonant ([r l n]) palatals surface, as in (25). The realization of /x ɣ/ as palatal after [r l n] is not conditioned by the type of vowel preceding that consonant; hence, Coalescence-1 is not present in the phonology of this dialect.

(25) Palatals (from (from /x ɣ/) after a coronal consonant:

a.	lųrχ	[lʊrç]	schlechter Kaffee	‘bad coffee’	29
	dįrχ	[dɪrç]	durch	‘through’	29
	ɑrjərə	[ɑːrʝərə]	ärgern	‘annoy-INF’	29
b.	bɑlχ	[bɑlç]	Kind	‘child’	48
c.	fęnχt	[fɛnçt]	voriges	‘previous-INFL’	28

Postsonorant palatal fricatives (in 21a, 22a, 23a, 24a) derive from the corresponding velars after a front [+tense] vowel by (26a) and after a consonant (in

25) by (26b); recall §3.4. Since [±tense],= is distinctive for vowels but not for consonants the two rules cannot be collapsed into one.

(26) a. Velar Fronting-10:

[+TENSE] [−SON, +CONT]

[CORONAL] [DORSAL]

b. Velar Fronting-3:

[+CONS, +SON] [−SON, +CONT]

[CORONAL] [DORSAL]

Tita (1921 [1965]) discusses the EPo dialect once spoken in the town of Kamnitz (Footnote 11.2). That author does not consider whether or not the velar nasal [ŋ] has a palatal realization. The dorsal obstruents for Kamnitz are listed in (27). The dialect does not have [g].

(27) a. /ɣ/ /ʝ/ /k/

[ɣ] [ʝ] [k] [c]

b. /x/ /ɣ/ /k/ /c/

[x] [ç] [ɣ] [ʝ] [k] [c]

The phonemic front vowels are /i ɪ eː ɛː ɛ/, the phonemic back vowels are /u ʊ oː o ɔː ɔ ə ɑː ɑ/, and the phonemic diphthongs are /ɑi ɛi ɑu ɛu/. I demonstrate below that velar fronting is active in postsonorant position and that it requires /ɛ/ – but not its long counterpart /ɛː/ – to be analyzed phonologically as [+low]; recall Rheintal (§3.4). The distinctive features for the phonemic vowels (excluding placeless schwa) are presented in Table 11.2.

Front vowels and back vowels are [coronal] and [dorsal] respectively. Within those two groups, the feature values [+low] and [−low] are assigned, and then within the two [−low] groups, the vowels are marked as [±high] and [±tense].

Kamnitz exhibits Contrast Type B in (2a) for word-initial [ɣ] and [ʝ]. [ɣ] (<WGmc +[ɣ]) occurs before a consonant (in 28a) or any back vowel with the exception of [ɑi] or [ə] (in 28b), but never before a front vowel. The original velar (+[ɣ]) is now realized as a palatal [ʝ] before the back vowels [ɑi] or [ə] (in 28c) or front vowels (in 28d). As in many other dialects, the original velar now participates in [ɣ]~[ʝ] alternations (in 28e). Palatal [ʝ] (<WGmc +[j]) occurs before any type of

Table 11.2: Distinctive features for vowels (Kamnitz)

	i	ɪ	eː	ɛː	ɛ	u	ʊ	oː o	ɔː ɔ	ɑː ɑ
[coronal]	✓	✓	✓	✓	✓					
[dorsal]						✓	✓	✓	✓	✓
[low]	−	−	−	−	+	−	−	−	−	+
[high]	+	+	−	−		+	+	−	−	
[tense]	+	−	+	−		+	−	+	−	

vowel (in 28f). Note that [ɣ] and [ʝ] contrast before the same back vowel in examples like [ɣɔːn] 'yarn' (in 28b) vs. [ʝɔːɣə] 'hunt-INF' (in 28f). Tita (1921 [1965]: 57) observes that [k] (⟦k⟧) is realized as velar or palatal depending on the context. On the basis of his data it can be concluded that [k] occurs before a consonant (in 28g) or any back vowel (in 28h) and [c] before any front vowel (in 28i).

(28) Word-initial dorsal obstruents:

a.	ɣlik	[ɣlik]	gleich	'soon'	49
b.	ɣǫn	[ɣɔːn]	Garn	'yarn'	64
c.	ʝɑitə	[ʝɑitə]	gießen	'water-INF'	60
	ʝənɑitə	[ʝənɑitə]	genießen	'enjoy-INF'	52
d.	ʝį̇lə	[ʝɪlə]	gelten	'be valid-INF'	60
	ʝę̄l	[ʝɛːl]	gelb	'yellow'	60
	ʝęsəl	[ʝɛsəl]	Gänschen	'goose-DIM'	60
e.	ɣɑst	[ɣɑst]	Gast	'guest'	59
	ʝęst	[ʝɛst]	Gäste	'guests'	59
f.	ʝųŋk	[ʝʊŋk]	jung	'young'	64
	ʝǫɣə	[ʝɔːɣə]	jagen	'hunt-INF'	64
g.	krẹuts	[krɛuts]	Karausche	'crucian carp'	57
h.	kōl	[koːl]	Kohl	'cabbage'	57
i.	kēl	[ceːl]	Kerl	'fellow'	57
	kẹinə	[cɛinə]	keimen	'germinate-INF'	57

In postsonorant position, [x ɣ] and [ç ʝ] never contrast. The generalization is that [x] occurs after a back vowel (in 29a) or [ɛ] (in 29b), while [ç] surfaces after front vowels other than [ɛ] (in 29c) or a coronal sonorant consonant (in 29d). The same generalizations hold for [ɣ ʝ] (in 29e-g) and for [x ç] derived historically from WGmc $^{+}$[ɣ] (in 29h-k). Umlaut alternations of the type [ɔ]~[ɛ] provide further support that [x] occurs after [ɛ] (see 31l). Velar [k] and palatal [c] (both from WGmc $^{+}$[k]) never contrast; the former occurs after back vowels (in 29m) and the former after front vowels (in 29n). No examples were found in the original source with [k] or [c] after a coronal sonorant consonant. At least one example (in 29o) has palatal [c] (< WGmc $^{+}$[k]) in the context after a historically syncopated front vowel (which is visible in the MoStGm orthography).[12]

(29) Postsonorant dorsal obstruents:

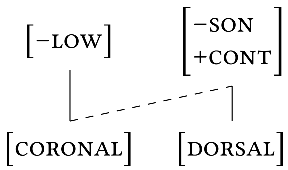
a.	hōx	[ho:x]	high	'high'	62
	tǫx	[tɔ:x]	zähe	'tough'	62
b.	dęxt	[dɛxt]	Docht	'wick'	62
	ręxt	[rɛxt]	recht	'right'	43
	fręx	[frɛx]	frech	'impudent'	62
c.	lįχt	[lɪçt]	leicht	'light'	49
	tēχt	[te:çt]	zehnte	'tenth'	76
d.	dįrχ	[dɪrç]	durch	'through'	62
e.	truγə	[truɣə]	trauen	'trust-INF'	50
	bǫγə	[bɔ:ɣə]	Bogen	'bow'	59
f.	krijə	[krijə]	kriegen	'get-INF'	49
	tę̄jəl	[tɛ:jəl]	Zügel	'rein'	48
g.	baljə	[baljə]	streiten	'argue-INF'	60
h.	naux	[naux]	genug	'enough'	49
i.	vęx	[vɛx]	Weg	'path'	43
j.	tiχ	[tiç]	Zeug	'stuff'	52
k.	tęlχ	[tɛlç]	Zweig	'branch'	43
l.	trǫx	[trɔx]	Trog	'trough'	45
	tręx	[trɛx]	Tröge	'troughs'	73
m.	rǫk	[rɔk]	Rock	'skirt'	57
n.	zaikə	[zaicə]	suchen	'search-INF'	57
o.	morętk	[morɛtc]	Meerrettich	'horseradish'	57

[12] Tita (1921 [1965]) does not provide an example for [c] after [ɛ], although he does give the one item [vɛlc] 'which' (=⟦węlk⟧), in which [c] (=⟦k⟧) occurs after the sequence [ɛl]. Two treatments suggest themselves for the fronting of /k/ in [vɛlc]: (a) velar fronting is triggered by /l/ (by 26b), or (b) the fronting of /k/ is indirectly triggered by the vowel /ɛ/: Coalescence-1 merges the [coronal] feature for /ɛ/ and /l/, and then velar fronting spreads [coronal] from any front vowel to a velar stop. Since no additional examples are provided I leave this question open.

The set of targets for the fronting of velars in word-initial position in (28) is /ɣ k/, and the set of triggers consists of front vowels but not coronal consonants. Synchronically derived [ʝ] is situated before a front vowel (in 28d and the second word in 28e). The palatal allophone [c] (in 28i) derives from /k/. The fronting of word-initial /ɣ k/ is accomplished by Wd-Initial Velar Fronting-6. All other instances of [ʝ] are underlying palatals (28c,f).

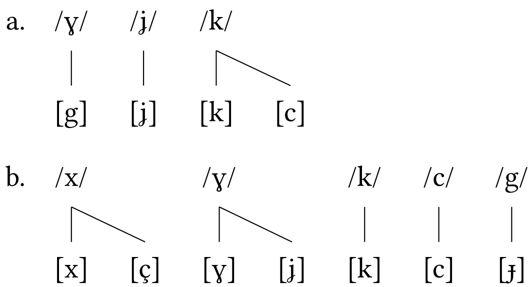
For postsonorant position, the target segments are /ɣ x k/ and the triggers are (a) the front [−low] vowels or (b) coronal sonorant consonants. Fronting in (a) and (b) is accomplished with (30) and (26b) respectively.

(30) Velar Fronting-2:



The distribution of dorsal obstruents in the town of Lauenburg (Pirk 1928; Footnote 11.2) is depicted in (31). Word-initial [g] is an allophone of /ɣ/. I comment on the status of dorsal nasals below.

(31)



As illustrated in (32a-f), Lauenburg exhibits Contrast Type B in (2a) for word-initial [g] and [ʝ]. The post-palatal back vowel in (32c) was historically front and shifted to a back vowel by either Vowel Retraction or Vowel Reduction. [g ʝ] in (32a-e) derived from a historical velar (WGmc ⁺[ɣ]). Palatal [ʝ] (<WGmc ⁺[j]) in (32f) stands before any type of vowel. [c] and [k] never contrast: The latter surfaces before a back vowel (in 32g) or consonant (in 32h) and the former before a front vowel (in 32i). [k]~[c] alternations are attested (in 32j).

(32) Word-initial dorsal obstruents:

a.	got	[gɔt]	Gott	‘God’	8

b.	glåt	[glɑt]	glatt	'smooth'	22
	glęk′	[glɛc]	Glück	'fortune'	9
c.	gåršt	[ɟɑrʃt]	Gerste	'barley'	8
	gəšainə	[ɟəʃɑ:inə]	geschehen	'happen-INF'	10
d.	gistrə	[ɟɪstrə]	gestern	'yesterday'	7
	gęlt	[ɟɛlt]	Geld	'money'	8
e.	gaus	[gɑ:us]	Gans	'goose'	19
	ganz	[ɟænz]	Gänse	'geese'	19
f.	gå^u r	[ɟɑur]	Jahr	'year'	10
g.	kau	[kɑ:u]	Kuh	'cow'	18
h.	krīgə	[kri:ʝə]	kriegen	'get-INF'	10
i.	k′int	[cɪnt]	Kind	'child'	7
	k′ɑstər	[cæstər]	Küster	'sexton'	8
j.	kop	[kɔp]	Kopf	'head'	14
	k′ɑp	[cæp]	Köpfe	'heads'	14

Velar fricatives [x ɣ] never contrast with the corresponding palatals in postsonorant position: The velars occur after back vowels (in 33a,c) and the palatals [ç ʝ] after front vowels (in 33b,d). No examples were found in which dorsal fricatives occur after consonants. The lenis palatal stop [ɟ] is the reflex of an earlier geminate (+[gg]) after a front vowel (in 33e; cf. OSax *hruggi* 'back'). No examples are provided in the original source for modern reflexes of a phonetic [g] (<WGmc +[gg] after back vowels). The relationship between [k] and [c] is not the same as the relationship between the other velar and palatal pairs discussed above. Velar [k] occurs after back vowels (in 33f) but never after front vowels, and [c] can be found in many items after a front vowel (in 33g). [k]~[c] alternations (in 33h) are also attested. However, palatal [c] also occurs in a context other than after a front vowel in diminutives (in 33i) and at the right edge of nouns and certain verbs (in 33j). [k c] in the examples referred to here derive from WGmc +[k].

(33) Postsonorant dorsal obstruents:

a.	doxtər	[dɔxtər]	Tochter	'daughter'	8
b.	knɑχt	[knæçt]	Knecht	'vassal'	18
c.	zūʒə	[zu:ɣə]	saugen	'suck-INF'	16
d.	laigə	[la:ijə]	lügen	'lie-INF'	16
e.	rig′ə	[rɪɟə]	Rücken	'back'	9
	zɑg′ə	[zæɟə]	sagen	'say-INF'	8

f.	bɑuk	[bɑːuk]	Buch	'book'	12
g.	ę̜k′	[ɛc]	ich	'I'	17
h.	bok	[bok]	Bock	'buck'	14
	bɑk′	[bæc]	Böcke	'bucks'	14
i.	ɑik′sk′ə	[ɑːicscə]	Eiche, dim	'oak-DIM'	18
	buŋksk′ə	[bʊŋkscə]	Käfer, dim	'bug-DIM'	18
	hę̜ltk′əs	[hɛltcəs]	Holzäpfel	'crab apples'	14
	krę̜lk′əs	[krɛlcəs]	Pellkartoffleln	'potatoes in the skin'	40
j.	mɑlk′	[mælc]	Milch	'milk'	8
	mɑlk′ə	[mælcə]	melken	'milk-INF'	8
	mulk	[mʊlk]	melkte	'milk-PRET'	30
	mulk′ə	[mʊlcə]	melkten	'milk-PRET PL'	30
	molk′ə	[mɔlcə]	gemolken	'milk-PART'	30

The word-initial sound in (32a,b,d,e) is velar /ɣ/, which surfaces as [ʝ] before a front vowel by Wd-Initial Velar Fronting-6. Elsewhere (before a back vowel or consonant) that /ɣ/ is realized as [g] by g-Formation-2 (§8.4). In the context before a back vowel (in 32c,f), the word-initial [ʝ] is an underlying palatal (/ʝ/). The word-initial sound in (32g-j) is /k/, which surfaces as [c] before a front vowel by Wd-Initial Velar Fronting-6 and otherwise as [k].

In postsonorant position velar /x ɣ/ are realized as palatal after a front vowel (in 33b,d) by Velar Fronting-8. I analyze the stop in (33e) as an allophone of /g/, which surfaces as palatal [ɟ] by Velar Fronting-8. The same process creates [c] from /k/ in (33f-h). The [c] in (33i,j) is an underlying palatal (/c/).[13] [14]

[13] Pirk (1928) does not comment on whether or not [ŋ] has a palatal realization in the neighborhood of front vowels. A few words in his grammar suggest that the sound transcribed as ⟦ŋ⟧ is phonetically [ɲ] after a front vowel because the palatal stop (and not the velar stop) follows that nasal, e.g. [pɪɲcstə] 'Pentecost' (=⟦piŋk′stə⟧). I tentatively conclude that /ŋ/ is one of the targets for velar fronting. This suggests that the [ɲc] in words like ⟦piŋk′stə⟧ is underlyingly /ŋk/, which surfaces as [ɲc] by Velar Fronting-8.

[14] It is not clear what the generalization is involving the alternations in (33j), but the occurrence of [k] and [c] after a back vowel plus [l] suggests that /c/ is a phonemic palatal because it contrasts with /k/. One could argue that the occurrence of [k] or [c] after a liquid in word-final position is a consequence of the stem vowel, i.e. [k] if that vowel is back and [c] if it is front. However, after [r], only [c] surfaces, even if the vowel preceding that [r] is back, e.g [mɑrcə] 'notice-INF' (=⟦mårk′ə⟧). (The same generalization holds for the palatal fricatives [ç ʝ], e.g. [bɑrç] 'mountain' (=⟦bårχ⟧), [bɑrʝə] 'mountains' (=⟦bårgə⟧)). It is conceivable that the set of triggers for postsonorant velar fronting includes all front vowels and /r/, but not /l/. If this were the correct treatment, it would be the only case in the present study in which only /r/ but not /l/ serves as trigger. Alternatively, there may be words not mentioned in Pirk (1928) containing [k] after [r], which would contrast with [c], as in (33j) for the context after /l/. I leave this question open.

Two varieties of EPo that are the essentially the same in terms of velar fronting are the ones once spoken in close proximity, namely Sępóno Krajeńskie (Darski 1973; Footnote 11.2) and Kreis Konitz (Semrau 1915a,b; Footnote 11.2). I describe below the latter variety.[15]

The phonemic dorsal consonants for Kreis Konitz are depicted in (34). In that system there are velar and palatal fricatives ([ɣ]/[ʝ] and [x]/[ç]), velar and palatal nasals ([ŋ]/[ɲ]), and the velar stop [k]. There is no palatal stop ([c]) corresponding to [k].

(34) a.

/ɣ/	/ʝ/	/ç/	/k/
|	|	|	|
[g]	[ʝ]	[ç]	[k]

b.

/x/	/ç/	/ɣ/	/ʝ/	/k/	/ŋ/	/ɲ/
|	|	|	|	|	|	|
[x]	[ç]	[ɣ]	[ʝ]	[k]	[ŋ]	[ɲ]

In Semrau's system [k x g ɣ ŋ] correspond to ⟦k x g ʒ ŋ⟧. For palatals, [ç]=⟦c⟧ or ⟦tc⟧ depending on the etymological source: ⟦c⟧ is historically a fricative (<$^+$[x] or $^+$[ɣ]) and ⟦tc⟧ a historical stop (<$^+$[k]) The dialect-specific sound change from [k] to [ç] is shown to be active synchronically. [ʝ] (=⟦^{d}j⟧) is described as a voiced lenis palatal fricative ('palataler Reibelaut, stimmhafte lenis'). As implied by the raised 'd', [ʝ] (=⟦^{d}j⟧) can be realized as an affricate in some places within Kreis Konitz (recall Map 15¨). Semrau is clear that her ⟦tc⟧ is a voiceless fortis palatal fricative ('palataler Reibelaut, simmlose fortis'), which is rendered in my transcription as [ç].

Word-initial position exemplifies Contrast Type B in (2a) for [k] (/k/) and [ç] (/ç/) as well as [g] (/ɣ/) and [ʝ] (/ʝ/): Velar [k g] surface before a back vowel (in 35a,b), but never before a front vowel, while palatal [ç ʝ] occur before front vowels (in 35c,d) or back vowels (in 35e,f,p). In word-initial position before a consonant, [k g] only surface if the vowel following the consonant is back (in 35g,h), while [ç ʝ] can surface if the stem vowel is front (in 35i,j) or back (in 35k,l). The back

[15] One difference between the two varieties is the nature of the velar fronting outputs. Recall from §10.5 that Sępóno Krajeńskie is the only known LGm variety with alveolopalatalization. The discussion in Semrau (1915a,b) does not provide a clear indication that her variety can also be so classified. The transcriptions in Darski (1973) indicate that the output for velar fronting for a velar stop target is a (sibilant) affricate (e.g. historical [k] is realized as [tɕ] in the context of front segments).

stem vowel in (35e,f,k,l) was etymologically front (e.g. [ɟɑːʃt] 'barley'; cf. OSax *gersta*); [çnɑi] 'knee'; cf. OSax *knio*). Regular alternations involving [k]~[ç] and [g]~[ɟ] are attested in word-initial position (in 35m-o). [k ç] in (35) derived historically from WGmc $^+$[k], [ɟ] in (35p) from WGmc $^+$[j] and [g ɟ] in the remaining examples from WGmc $^+$[ɣ].

(35) Dorsal obstruents in word-initial position

a.	kǫp	[kɔp]	Kopf	'head'	192
b.	gɑɑv	[gɑːv]	Garbe	'sheaf'	194
c.	tcįn	[çɪn]	Kinn	'chin'	193
d.	ᵈjelt	[ɟelt]	Geld	'money'	194
e.	tcǫǫtcən	[çɔːçən]	Küche	'kitchen'	193
f.	ᵈjɑɑšt	[ɟɑːʃt]	Gerste	'barley'	195
g.	knųt	[knʊt]	Flachsknoten	'flax knot'	185
h.	groot	[groːt]	groß	'large'	195
i.	tcleet	[çleːt]	Kleid	'dress'	193
j.	ᵈjrüt	[ɟrʏt]	Grütze	'groats'	195
k.	cnɑi	[çnɑi]	Knie	'knee'	195
l.	ᵈjrooiə	[ɟroːiə]	grüne	'green-INFL'	195
m.	kǫǫ'f	[kɔːf]	Korb	'basket'	194
	tcö̦ö̦'v	[çœːv]	Körbe	'baskets'	194
n.	krɑɑnts	[krɑːnts]	Kranz	'wreath'	193
	tcrįnnts	[çrɪnts]	Kränze	'wreaths'	193
o.	gɑɑs	[gɑːs]	Gans	'goose'	194
	ᵈjęę'z	[ɟɛːz]	Gänse	'geese'	195
p.	ᵈjum	[ɟum]	Junge	'boy'	196

Contrast Type B is also attested in postsonorant position (=2b). In that context velars [k x ɣ] surface after a back vowel (in 36a-c) but never after a front vowel or coronal sonorant consonant. The palatals [ç ɟ] occur after a front vowel (in 36d,e), coronal sonorant consonant (in 36f,g) or back vowel (in 36h,i). The [ç] in (36h) was once preceded by a coronal sonorant consonant (cf. MHG *arc* 'bad'). Example (36i) illustrates that palatal [ɟ] can occur after a back vowel. Alternations in postsonorant position between [k]~[ç] (in 36j) and [ɣ]~[ɟ]/[ç] (in 36k) are common. All dorsal stops and fricatives referred to above derive from historical velars (WGmc $^+$[ɣ k]).

(36) Dorsal obstruents in postsonorant position:

a.	brukə	[brukə]	brauchen	'need-INF'	193
b.	dɑxt	[dɑxt]	Docht	'wick'	196
c.	fǭʒəl	[fɔːɣəl]	Vogel	'bird'	194
d.	slęct	[slɛçt]	schlecht	'bad'	196
	fę̄tcə	[fɛːçə]	Ferkel	'piglet'	193
e.	rę̄^{d}jənə	[rɛːʝənə]	regnen	'rain-INF'	149
f.	bɑɑltcə	[bɑːlçə]	Balken	'beam'	194
	vųų'ltcə	[vʊːlçə]	Wolken	'clouds'	251
g.	mų̈ r^{d}jəl	[mʏrʝəl]	Mergel	'marl'	195
h.	bǫǫtc	[bɔːç]	Borke	'bark'	194
	ɑɑc	[ɑːç]	arg	'bad'	196
i.	zǫǫ^{d}j	[zɔːʝ]	Sau	'sow'	195
j.	brę̄tcə	[breːçə]	brechen	'break-INF'	242
	brętcst	[brɛçst]	brichst	'break-2SG'	242
	brętct	[brɛçt]	bricht	'breaks-3SG'	242
	brɑk	[brɑk]	brach	'broke-PRET 3SG'	242
	breetcst	[breːçst]	brachst	'broke-PRET 2SG'	242
k.	drǭʒən	[drɔːɣən]	tragen	'carry-INF'	195
	drǫ̈ct	[drœçt]	trägt	'carries-3SG'	195
	fǭʒəl	[fɔːɣəl]	Vogel	'bird'	194
	fǫ̈ǫ̈^{d}jəls	[fœːʝəls]	Vögel	'birds'	252

The (2b) contrast also holds for nasals: [ŋ] surfaces only after a back vowel (in 37a), but never after a front vowel or consonant, and [ɲ] after a front vowel (in 37b) or a back vowel (in 37c). Note the near minimal pair [zuŋə] 'sung-PART' in (37a) vs. [fuɲə] 'found-PART' in (37c). [ŋ]~[ɲ] alternations as in (37d) are common.

(37) Dorsal nasals in postsonorant position:

a.	slɑŋ	[slɑŋ]	Schlange	'snake'	201
	zuŋə	[zuŋə]	gesungen	'sung-PART'	171
b.	fiŋ̄ə	[fɪɲə]	Finger	'finger'	201
	iŋ̄	[ɪɲ]	Ende	'end'	202
c.	huŋ̄ət	[huɲət]	hundert	'hundred'	202
	fuŋ̄ə	[fuɲə]	gefunden	'found-PART'	171
d.	tviŋ̄ə	[tviɲə]	zwingen	'force-INF'	241
	tvuŋk	[tvuŋk]	zwang	'forced-PRET'	241

Palatal [ɲ] in (37b) derived historically from [ŋ] by velar fronting. That velar could be either an original [ŋ] (e.g. [fɪɲə] < [fɪŋə]) or a new [ŋ] created by Gutturalization (=1b), e.g. [ɪɲ] < [ɪŋ] < [ɪnd]). It is not clear from the original source what triggered the change from [ŋ] to [ɲ] in (37c).

The word-initial palatal before a back vowel (in 35e,f,p) or before a liquid followed by a back vowel (35k,l) is an underlying palatal (/ʝ/ or /ç/). Word-initial [g]~[ʝ] alternations in (35o) are accounted for with an underlying velar (/ɣ/) that surfaces as [ʝ] before a front vowel by Wd-Initial Velar Fronting-6 and as [g] in the elsewhere case by g-Formation-2 (§8.4); recall Lauenburg in (31a). Nonalternating [ʝ] before a front vowel (in 35d) is likewise analyzed as /ɣ/. In (35j) the [coronal] feature of the front vowel and of the preceding sonorant consonant merge to a single instantiation of [coronal] by Coalescence-2. The latter process feeds Wd-Initial Velar Fronting-6, thereby creating [ʝ]. Word-initial velars before back vowels (in 35a,b) or before back vowels separated by a consonant (in 35g,h) are underlying velars (/k ɣ/). As described above, /ɣ/ is realized as [g] by g-Formation-2.

Kreis Konitz is the only dialect uncovered in the present survey with regular [k]~[ç] alternations. The sound underlying [k]~[ç] alternations for word-initial position (in 35m,n) is /k/, which undergoes fronting to the corresponding palatal (|c|) by Wd-Initial Velar Fronting-6. That palatal stop surfaces as [ç] by (38). The change from stop to fricative is stated without a context because any derived palatal stop (|c|) is realized as the corresponding fricative, regardless of whether or not it is word-initial or postsonorant (see below). Given the distribution of [k] and [ç], I analyze [ç] in nonalternating examples like (35c) as /k/ as well. Example (35i) is accounted for formally as (35j) described in the preceding paragraph.

(38) c-Spirantization:

$$\begin{bmatrix} -\textsc{son} \\ -\textsc{cont} \\ \textsc{coronal} \\ \textsc{dorsal} \end{bmatrix} \longrightarrow [+\textsc{cont}]$$

After a back vowel (in 36h,i) [ç ʝ] are underlying palatals (/ç ʝ/). All other postsonorant dorsal obstruents in (36) are underlying velars (/k x ɣ/), which shift to the corresponding palatals after a coronal sonorant (in 36d-g,j,k) by Velar Fronting-9. The derived palatal (|c|) from /k/ surfaces as [ç] by c-Spirantization. The nasal (/ŋ/) in (37a,b,d) bears the [dorsal] feature and surfaces as palatal after a front vowel (in 37b) by Velar Fronting-9. In the context after back vowels (in 37c), [ɲ] is an underlying palatal (/ɲ/).

Although velar noncontinuants typically pattern together with the velar fricatives as targets for velar fronting in EPo, other EPo varieties have a narrower set of targets. One dialect in which velar noncontinuants fail to serve as triggers for velar fronting was mentioned above, namely Kreis Rummelsburg (=20), which contrasts with the broad set of targets in the neighboring variety once spoken in Kreis Bütow (in 17). A second example not mentioned earlier is Kreis Schlawe (Mahnke 1931; Footnote 11.2). As in Lauenburg (=31), Kreis Schlawe has a version of velar fronting that shifts /ɣ/ to [ʝ] in word-initial position before a front vowel; before a back vowel or consonant, /ɣ/ surfaces as [g] by g-Formation-2, e.g. [ʝɛlt] 'money' (=⟦ĝelt⟧) vs. [gɑːə] 'go-INF' (=⟦gåə⟧). In postsonorant position, the two velars that undergo fronting to palatal are /x ɣ/, e.g. [lɑxə] 'laugh-INF' (=⟦lɑxə⟧) vs. [ʃlɛçt] 'bad' (=⟦šleχt⟧); [oːɣ] 'eye' (=⟦ōʒ⟧) vs. [ʃwiːʝə] 'be silent-INF' (=⟦swīĝə⟧). Mahnke (1931: 35) makes no reference to a palatal realization of [k], noting that MLG [k] is preserved in all positions as [k] (=⟦k⟧). No mention is made of a palatal realization of [ŋ]. From the formal perspective, the set of targets for velar fronting in the Kreis Schlawe variety is restricted to velar fricatives (=Wd Initial Velar Fronting-3 in §4.3 and Velar Fronting-1).

11.6 Low and High Prussian

In several varieties of LPr it is clear from the original sources that the targets for velar fronting (both word-initial and postsonorant) consist of velar fricatives and velar noncontinuants. In some sources for LPr the palatal realization of sounds like /k/ and /ŋ/ is simply commented on but not expressed with separate phonetic symbols, but other sources provide distinct symbols for velars and palatals and therefore enable one to draw conclusions concerning the triggers and targets for velar fronting. I consider data from one LPr variety and from one HPr variety and then conclude by discussing briefly a few briefly some of the sources for LGm/HGm dialects spoken in the same region.

Natau (1937) describes the LPr dialects once spoken in the northeastern part of East Prussia, concentrating on the small village of Willuhnen (Footnote 11.2). That dialect has the phonemic dorsal sounds and their realizations depicted in (39). Among those sounds are the two palatal noncontinuants [c ɲ]. Natau transcribes those sounds with the same phonetic symbol for the corresponding velars (⟦k⟧ and ⟦ŋ⟧), but he gives very clear statements regarding the velar vs. palatal distribution (p. 31–32). The stop [g] (=⟦g⟧) is present as the reflex of WGmc $^{+}$[gg], e.g. ⟦rigə⟧ 'back', but Natau does not discuss whether or not his ⟦g⟧ is velar or palatal after a front vowel.

(39) a. /ɣ/ /ʝ/ /k/

[ɣ] [ʝ] [k] [c]

b. /ɣ/ /x/ /k/ /ŋ/

[ɣ] [ʝ] [x] [ç] [k] [c] [ŋ] [ɲ]

Word-initial position (=40a-g) illustrates Contrast Type B in (2a) for [ɣ] and [ʝ]. The initial palatal in (40f) was historically velar (WGmc ⁺[ɣ]) and the one in (40g) was the etymological palatal. Velar and palatal stops [k]/[c] stand in an allophonic relationship. In word-initial position [k] occurs before any back vowel (in 40h) or consonant (in 40i) and [c] before any front vowel (in 40j); Natau (1937: 31). Examples (40b,i) illustrate that Coalescence-2 is not active in this dialect.

(40) Word-initial dorsal obstruents:

a.	ɣuldə	[ɣʊldə]	Gulden	'Guilder'	15
b.	ɣrīs	[ɣriːs]	grau	'gray'	35
c.	jēərn	[ʝeːərn]	gern	'gladly'	56
	jǣəršt	[ʝæːərʃt]	Gerste	'barley'	34
d.	ɣast	[ɣɑst]	Gast	'guest'	57
	jæst	[ʝæst]	Gäste	'guests'	57
e.	ɣrōət	[ɣroːət]	groß	'large'	56
	ɣretər	[ɣrɛtər]	größer	'larger'	56
f.	jəkoft	[ʝəkɔft]	gekauft	'bought-PART'	21
g.	juŋ	[ʝʊŋ]	Junge	'boy'	55
h.	korf	[kɔrf]	Korb	'basket'	31
i.	kreb	[krɛb]	Krippe	'crib'	31
j.	ken	[cɛn]	Kinn	'chin'	31
	kæp	[cæp]	Köpfe	'heads'	31

In postsonorant position [x ɣ] only occur after a back vowel (in 41a,d) and [ç ʝ] after a front vowel (in 41b,e) or liquid (in 41c,f). [k] and [c] have a parallel distribution (in 41g-i). As in West Mecklenburg (§11.3) and Sebnitz (§11.4), [ŋk] occurs after a back vowel and [ɲc] after a front vowel.[16] From the historical perspective, [x ç] derive from WGmc $^{+}$[x], [ɣ ʝ] from WGmc $^{+}$[ɣ], [k c] from WGmc $^{+}$[k], and [ŋ ɲ] from WGmc $^{+}$[ŋ].

(41) Postsonorant dorsal consonants:

a.	brux	[brʊx]	Bruch	‘fracture’	32
b.	hæχt	[hæçt]	Hecht	‘pike’	32
c.	štorχ	[ʃtɔrç]	Storch	‘stork’	32
d.	frǭəɣə	[frɔːəɣə]	fragen	‘ask-INF’	36
e.	ne·ijə	[neiʝə]	neigen	‘incline-INF’	21
f.	zorjd	[zɔrʝd]	sorgte	‘care for-PRET’	36
g.	dak	[dɑk]	Dach	‘roof’	31
h.	ek	[ɛc]	ich	‘I’	32
i.	molkə	[mɔlcə]	Molke	‘whey’	32
j.	baŋk	[bɑŋk]	Bank	‘bank’	32
k.	driŋkə	[drɪɲcə]	trinke	‘drink-1SG’	32

From the formal point of view, the initial sounds in (40a-e) is /ɣ/, and in (40h-j) it is /k/. Those velars surface as palatal in word-initial position before a front vowel by Wd-Initial Velar Fronting-6. In the context before a back vowel the initial sound in (40f,g) is an underlying palatal (/ʝ/). In postsonorant position (=41), /x ɣ k/ shift to the corresponding palatals after a coronal sonorant by Velar Fronting-9.

The dorsal consonants of the HPr variety once spoken in Reimerswalde (Kuck & Wiesinger 1965; Footnote 11.2) have the distribution depicted in (42):

(42) a.

/ʝ/	/k/	/c/	/g/	/ɟ/
|	|	|	|	|
[ʝ]	[k]	[c]	[g]	[ɟ]

b.

/x/		/ʝ/	/k/	/c/	/g/	/ɟ/	/ŋ/	
|	\\	|	|	|	|	|	|	\\
[x]	[ç]	[ʝ]	[k]	[c]	[g]	[ɟ]	[ŋ]	[ɲ]

[16] Natau (1937: 26) transcribes the diminutive suffix as ⟦kə⟧, but he does not say whether or not the ⟦k⟧ is phonetically [k] or [c], e.g. ⟦kīəlkə⟧ ‘wedge-DIM’. In certain EPo varieties, the consonant in that suffix is realized consistently as [c], regardless of the nature of the preceding sound (e.g. Lauenburg; recall 33i).

The word-initial examples in (43a-m) exhibit Contrast Type B in (2a) for [k g] (<WGmc +[k ɣ]) and the corresponding stops [c ɟ]. [ʝ] occurs before any type of vowel. The palatal in (43n) derives from WGmc +[j] and the one in (43o) from WGmc +[ɣ].

(43) Word-initial dorsal obstruents:

a.	kū	[ku:]	Kuh	'cow'	130
b.	gǭrə	[gɔrə]	Garn	'yarn'	144
c.	ḱen	[cen]	Kinn	'chin'	137
d.	gęlt	[ɟɛlt]	Geld	'money'	143
e.	ḱɑvɒ	[cɑ:vɐ]	Käfer	'bug'	137
	ḱɑen	[cɑen]	Keim	'germ'	124
f.	gɑršt	[ɟɑ:rʃt]	Gerste	'barley'	144
	gɑest	[ɟɑest]	Geist	'intellect'	128
g.	krɑot	[krɑot]	Kraut	'herb'	137
	klǫgə	[klɔ:gə]	klagen	'complain-INF'	137
	knǫpə	[knɔpə]	Knoten	'knot'	137
h.	ḱrɑfs	[crɑ:fs]	Krebs	'crab'	139
	ḱlɑe	[clɑe]	Kleie	'bran'	124
i.	grɑp	[grɑp]	Grab	'grave'	141
j.	grɑbələ	[ɟrɑbələ]	greifen	'grasp-INF'	140
	glɑeχ	[ɟlɑeç]	gleich	'soon'	139
k.	glek	[ɟlek]	Glück	'fortune'	143
	ḱnepə	[cnepə]	knüpfen	'tie-INF'	137
l.	kǫp	[kɔp]	Kopf	'head'	119
	ḱęp	[cɛp]	Köpfe	'heads'	120
m.	klụk	[klʊk]	klug	'clever'	131
	klīgɒ	[cli:ɟɐ]	klüger	'more clever'	131
n.	jūgənt	[ju:gənt]	Jugend	'youth'	117
	jēnɒ	[ʝɛ:nɐ]	jener	'that-MASC SG'	146
o.	jəblēivə	[ʝəble:ivə]	geblieben	'stayed-PART'	143

In postsonorant position, [x] and [ç] never contrast: [x] occurs after back vowels (in 44a) and [ç] after front vowels (in 44b) or coronal sonorant consonants (in 44c,d). [k g] and [c ɟ] illustrate Contrast Type B in (2b); see (44e-m). Alternations between velar and palatal stops are well-attested (in 44n). In contrast to [k], [g] never surfaces after a consonant, but [ʝ] does (in 44o). [ʝ] surfaces after a historically elided front vowel (in 44p). No examples were found in the original source for [x] after [uː], which is not a common vowel in the dialect.

(44) Postsonorant dorsal obstruents:

a.	vǫx	[vɔx]	Woche	'week'	119
	dɑx	[dɑx]	Dach	'roof'	142
b.	rįχə	[rɪçə]	riechen	'smell-INF'	130
	hęχt	[hɛçt]	Hecht	'pike'	118
c.	štǫrχ	[ʃtɔrç]	Storch	'stork'	139
d.	melχ	[melç]	Milch	'milk'	115
e.	krųk	[krʊk]	Krug	'jug'	131
f.	mɑgə	[mɑːgə]	Magen	'stomach'	122
g.	reḱ	[rec]	Rücken	'back'	117
h.	šp̨igəl	[ʃpɪɟəl]	Spiegel	'mirror'	144
i.	vɑḱ	[vɑːc]	Weg	'path'	147
j.	flɑgə	[flɑːɟə]	pflegen	'care for-INF'	121
k.	štɑrk	[ʃtɑːrk]	stark	'strong'	122
l.	vęrḱ	[vɛrc]	Werk	'work'	121
	męlḱə	[mɛlcə]	melken	'milk-INF'	121
m.	bɑrḱ	[bɑːrc]	Berg	'mountain'	121
n.	zɑogə	[zɑogə]	saugen	'suck-INF'	124
	zɑeḱst	[zɑecst]	säugst	'sucks-2SG'	125
o.	mǫrjə	[mɔrʝə]	morgen	'tomorrow'	119
	fęnj	[fɛnʝ]	Pfennige	'pennies'	143
p.	lɑvχ	[lɑːvç]	lebendig	'lively'	121
	rūχ	[ruːç]	ruhig	'quiet'	132
	rūjɒ	[ruːjɐ]	ruhiger	'more quiet'	143

The velar nasal and the palatal nasal stand in an allophonic relationship: [ŋ] only surfaces after a back vowel (in 45a) and [ɲ] only after a front vowel (in 45b-d). The palatal nasal has two historical sources: WGmc $^+$[ŋ] by velar fronting (in 45b) or WGmc $^+$[nd] by Gutturalization (1b, in 47c). [ŋ]~[ɲ] alternations are attested (in 45e).

(45) Dorsal nasals in postsonorant position:

a.	tsu̦ŋ	[tsʊŋ]	Zunge	‘tongue’	116
b.	eŋ́əl	[eɲəl]	Engel	‘angel’	149
c.	li̦ŋ́	[lɪɲ]	Linde	‘linden tree’	115
d.	hu̦i̦ŋ́t	[hʊɪɲt]	Hund	‘dog’	142
e.	jəfu̦ŋə	[ʝəfʊŋə]	gefunden	‘found-PART’	116
	fi̦ŋ́ə	[fɪɲə]	finden	‘find-INF’	115

In word-initial position, underlying velar stops (/k g/) surface as palatal ([c ɟ]) before a front vowel (in 43c,d,l) by Wd-Initial Velar Fronting-6. If /k g/ are followed by a liquid plus front vowel (in 43k,m) then the feature [coronal] of that front vowel merges with the [coronal] feature of the liquid by Coalescence-2, which then feeds Wd-In Vel-Fr-6. Word-initial palatal stops are underlyingly palatal (/c ɟ/) before a back vowel (in 43e,f) or before a consonant followed by a back vowel (in 43h,j). [ʝ] is likewise an underlying palatal (in 43o).

In postsonorant position the allophones [x] and [ç] (in 44a-d) derive from /x/, which is realized as palatal [ç] after a coronal sonorant by Velar Fronting-1. For the nasal allophones [ŋ ɲ] in (45) the underlying sound is /ŋ/, which surfaces as [ɲ] after a front vowel by Velar Fronting-8. The latter process also accounts for the realization of /k g/ as [c ɟ] after a front vowel (in 44g,h,n). If /k g/ are preceded by a front vowel plus liquid sequence (in 44l) then Coalescence-1 merges [coronal] from the front vowel and the liquid, thereby feeding Vel-Fr-8, e.g. /vɛrk/⟶|vɛ**r**k|⟶[vɛrc]. In postsonorant position palatal stops are underlying sounds (/c ɟ/) after back vowels (in 44i,j) and after consonants preceded by back vowels (in 44m). [ç ʝ] are likewise underlying sounds (quasi-phonemes /ç ʝ/) in (44p).

The two case studies discussed in this section have in common that velar noncontinuants and the velar fricatives serve as targets for velar fronting. However, other German varieties once spoken in the same region (East Prussia) have a narrower set of targets. Two very similar varieties are the ones described by Bink (1953) in and around the village of Mandtkeim and Mitzka (1919) for Königsberg (Footnote 11.2). It is clear from both sources the palatal fricatives [ç ʝ] are allophones of the corresponding velars in postsonorant position, e.g. Königsberg [vʊxt] ‘impact’ (=⟦wuxt⟧) vs. [kɪç] ‘kitchen’ (=⟦kĭχ⟧); [tuːɣənt] ‘virtue’ (=⟦tûɣənt⟧) vs. [kriːʝə] ‘get-INF’ (=⟦krîjə⟧). However, neither Mitkza nor Bink give any indication that there are palatal stops or a palatal nasal and hence the corresponding velar sounds even in the front vowel context. From the formal perspective the set of target segments for velar fronting consists of velar fricatives (/ɣ x/) but not velar noncontinuants; i.e. Velar Fronting-1.

11.7 Summary

There are two clearly identifiable patterns for the set of velar fronting targets for both word-initial and postsonorant position, namely (A) the broad group consisting of all velar consonants, or (B) the narrow set of sounds comprising all and only velar fricatives.

(A) holds for postsonorant velar fronting in West Mecklenburg, Sebnitz, Seifhennersdorf, Kreis Bütow, Kamnitz, Laueburg, Kreis Konitz, Willuhnen, and Reimerswalde, while the narrow group of target sounds in (B) is attested in Kreis Rummelsburg, Kreis Schlawe (§11.5), and Königsberg (§11.6). There are no clear-cut cases in which the set of targets consists of velar fricatives and velar stops but not the velar nasal (recall the discussion of targets in the typological literature discussed in §2.3). Kamnitz is a potential example, but this conclusion cannot be definitive because the original source is not clear on whether or not the velar nasal has a palatal variant after front vowels. In one dialect mentioned earlier (Bleckede; §11.3) both /x/ and /ɣ/ appear after a sonorant, but only /x/ undergoes fronting. In a number of localities there is a single dorsal fricative as a target (/x/) with velar noncontinuants not undergoing fronting, i.e. South Mecklenburg, Ivenack-Stavenhagen, Wolgast, Hemmelsdorf, Kreis Herzogtum Lauenburg from §11.3 and Großschönau, Schokau, West Lausitz from §11.4. Since /ɣ/ is not present in those dialects it cannot be known whether or not the set of targets consist of all velar fricatives or only /x/, as in Bleckede. In Kaarßen and Barth (§11.3) it cannot be determined whether or not all velar consonants are undergoing fronting (=A) or only the fricatives (=B). Note that Barth is also a potential example of the Bleckede system where only /x/ but not /ɣ/ undergoes fronting.

The predominant pattern for word-initial position is for any velar consonant present in that context to undergo fronting (=A), i.e. West Mecklenburg, Sebnitz, Seifhennersdorf, Kreis Bütow, Kamnitz, Lauenburg, Kreis Konitz, Willuhnen, Reimerswalde.

The broadest context (coronal sonorant consonants) is well-attested in postsonorant position, i.e. Seifhennersdorf, Kreis Bütow, Kreis Konitz, Willuhnen. However, those triggers are not attested in all dialects. First, the set of triggers for a number of varieties listed above consists of front vowels but crucially not the coronal sonorant consonants. That narrow set of triggers is particularly well-attested in word-initial position, e.g. Kamnitz, Kreis Lauenburg, Willuhnen. Second, two dialects are documented with an even narrower group of triggers for postsonorant fronting: nonlow front vowels (Kamnitz) and front tense vowels (Kreis Rummelsburg). Nonlow triggers are attested in German dialects outside of the region investigated in this chapter, i.e. Rheintal (§3.4), Rhoden (§5.2), Obersaxen (§6.3). However, the front tense vowel context is otherwise without precedent in German dialects (see §12.7.2).

Several dialects discussed in the present chapter exhibit the effects of Coalescence-1 or Coalescence-2. As noted earlier, places with one of those processes of coalescence are situated in the same area as the ones in which they are absent. For example, in West Mecklenburg, the /x/ after a sequence of back vowel plus liquid surfaces as [x], but after a front vowel plus liquid as [ç] (=5b,d). By contrast in South Mecklenburg /x/ surfaces in both contexts as [ç]. See §12.8.1 for further discussion of how the two processes of coalescence fit into German dialects as a whole.

11.8 Velar noncontinuant targets viewed historically

I consider first (§11.8.1) the historical interpretation of the two types of dialect referred to in §11.7 and then the influence non-Gmc language on that development (§11.8.2).

11.8.1 Extension of velar fronting targets

The two patterns referred to in §11.7 – broad targets (A) and narrow targets (B) – mirror two distinct historical stages. In particular, velar fronting was originally phonologized with a smaller set of targets (B), and later the set of targets was expanded to include all velar consonants (A); recall the rule generalization model from §2.4.1. That historical progression supports the implication in (46) (from §2.3.2), which German dialects obey without exception.[17]

(46) Implicational Universal for Velar Fronting Targets-1:
If a velar stop (/k g/) undergoes velar fronting then the corresponding fricative (/x ɣ/) does as well.

As stated above, (46) correctly predicts that there are dialects in which velar stops and velar fricatives serve as targets (A) as well as dialects where only velar fricatives undergo fronting (B). However, the same implication precludes dialects in which only velar stops undergo the change but velar fricatives in the same context fail to exhibit fronting. The final clause in the preceding sentence ["…velar fricatives in the same context…"] is important because there are dialects in which

[17] In (46) and below I juxtapose velar fricatives (/x ɣ/) with velar stops (/k g/). It may be possible to propose a similar generalization for the velar nasal (/ŋ/).

velar fronting targets stops, but velar fricatives are not present in that context. One example is West Mecklenburg, in which velar fronting targets /k g/ in word-initial position (=4). Significantly, neither /x/ nor /ɣ/ occur word-initially.

Although (46) holds without exception for German, it cannot be universally valid (recall the discussion on the typology of velar palatalization targets in §2.3.2). Since there are many languages where velar stops undergo fronting/palatalization but not the velar fricatives, it should come as no surprise that there is no phonetic motivation for (46).

The reason (46) is correct for German is due to the history of velar fronting targets, as described above: The first targets historically were velar fricatives, while the velar noncontinuants were only added to that set at a later stage. The narrow targets have been in the language for such a long time that that version of velar fronting has had time to diffuse geographically through virtually all of modern-day Germany and most of Austria; hence, there are very few places in Germany and Austria where velar fronting could be phonologized with only velar noncontinuants as the sole targets.

11.8.2 Influence from non-Germanic languages

The palatal noncontinuants investigated in this chapter ([c ɟ ɲ]) derived historically from the corresponding velars by some version of velar fronting. That assessment is not controversial because the original velars are preserved in other dialects. For example, in Reimerswalde (§11.6), the initial sound in the native German word 'money' is palatal ([ɟ]), i.e. [ɟɛlt], but that palatal surfaces in other dialects as velar ([g]), e.g. MoStGm [gɛlt]. Sounds like [c ɟ ɲ] therefore have the same history as the palatal fricatives [ç ʝ] in the dialects discussed in previous chapters in the sense that both sets of sounds arose via some version of velar fronting. Those noncontinuants that are now palatal quasi-phonemes or phonemic palatals were once allophones of velars in the neighborhood of front segments that served as triggers for velar fronting. When those front sounds elided or shifted to back sounds, the palatal noncontinuant allophones were encoded directly in underlying representations.

Most dialects with expanded targets are coterritorial with one or more Slavic language, in particular Polish and Kashubian (both West Slavic). Slavic languages possess phonemic sounds that are similar phonetically to [c ɟ ɲ]. Although the palatal noncontinuants discussed below had an endogenous (German-internal) history whose emergence is structural (phonological), I suggest that social factors (contact with Slavic languages) probably played a role in their phonologization as well.[18]

Before discussing the Slavic influence on German dialects, consider the way in which palatal noncontinuants arose in native German words. As a representative example, I provide three items in (47) from Reimerswalde illustrating the development of WGmc ⁺[k] in word-initial position. These three concrete examples from one particular variety are representative of the palatal noncontinuants in the other varieties discussed above. Stage 1 represents the point where velar fronting was absent and /k/ surfaced without change as [k], although phonetic (coarticulatory) fronting is assumed to have been present at that point. At Stage 2, velar fronting was phonologized. That process applied in the context before front vowels, as indicated in the first example and in the third example. At Stage 3, Vowel Retraction restructured the vowel /iː/ to /ɑe/, a change that triggered the restructuring of the original /k/ to the phoneme /c/ at Stage 3. The change from /yː/ to /iː/ in the final example is assumed to have postdated the change from /iː/ to /ɑe/. Velar fronting continued to operate before front vowels, as in the final two examples.

(47)

/kiːn/	/kuː/	/kyː/	
[kiːn]	[kuː]	[kyː]	Stage 1
/kiːn/	/kuː/	/kyː/	
[ciːn]	[kuː]	[cyː]	Stage 2
/cɑen/	/kuː/	/kiː/	
[cɑen]	[kuː]	[ciː]	Stage 3
Keim	*Kuh*	*Kühe*	MoStGm
‘germ’	‘cow’	‘cows’	

Examples like [cɑen] ‘germ’ show that the etymological front vowel /iː/ (cf. OHG *kīmo*) has left its trace in the form of the palatal [c] (/c/), which was formerly

[18]This question has been discussed in the literature for a number of years; a representative example of the type of publication that was common over one century ago is Gréb (1921), who discusses the findings of Semrau (1915a), Semrau (1915b) at length (§11.5). Another linguist who observes a correlation between palatal stops in ELGm dialects and Slavic languages is Mitzka (1959: 120–124). A more recent study concerning itself specifically with velar fronting (referred to by the author as ‘Palatalisierung’) is the LPr variety of Plautdietsch (Siemens 2012: 92–98). The Plautdietsch facts are similar but not identical to the EPr varieties I discuss in this chapter; one difference is that in Plautdietsch, etymological [l n] both surface as the corresponding palatals.

a positional variant of /k/.[19]

Why did velar fronting affected velars like /k/ predominantly in those German-speaking areas coterritorial with Slavic languages? There was unarguably contact between speakers of Slavic languages and speakers of the German dialects examined in this chapter, and I claim that this contact probably played a role in the extension of velar fronting to velar noncontinuants.

There is more than one way in which language-contact might have played out. I describe a possible scenario which involves the acquisition of Slavic loanwords, although variations on the same theme are also conceivable. It needs to be stressed that the progression of changes described here is highly speculative. First, not all of the original sources cited earlier discuss Slavic loanwords, and second – even in those works where that type of loanword is included – not all of them contain palatal noncontinuants. Consider now the three historical stages given in P-Q. WeSl designates a West Slavic language (see discussion below) and EaGm those varieties of ELGm and ECGm with palatal noncontinuants

Stage P: EaGm had velar fronting, which only affected velar fricatives (/x ɣ/); velar noncontinuants may have been subject to coarticulatory (phonetic) fronting;

Stage Q: WeSl loanwords with palatal noncontinuants were acquired by speakers of EaGm;

Stage R: The presence of palatal noncontinuants in WeSl loanwords in EaGm served as a catalyst for the extension of the set of triggers for velar fronting from velar fricatives to all velar consonants.

Stage P corresponds to Stage 2 in (47) and Stage R to Stage 3. Stage Q therefore represents a point not depicted above between Stage 2 and Stage 3.

Linguistic evidence points to a phonologization of velar fronting in WCGm at a very early date, namely around the 9th century (Chapter 16). The northeastern parts of pre-1945 Germany discussed in this chapter were originally populated by Slavic peoples, and German-speaking settlers only entered that region via the Ostsiedlung in a series of waves beginning in the 11th century. I speculate that

[19] (47) is intended to illustrate that velar fronting affected velar noncontinuants like [k] in native words. Some of the examples discussed in the present chapter reveal that velar fronting also applied in loanwords; however, examples like those involve loanwords that have been well-integrated into the language, e.g. the word ‘head’ (and its plural) MoStGm [kɔpf]~[kœpfə] from (43l) was originally borrowed from Latin *cūpa, cuppa*.

many of those settlers brought Stage P/Stage 2 velar fronting with them in that migration eastwards.

One difficulty involving Stage Q is that the historical rule of velar fronting was phonologized many centuries ago, and for that reason it is not clear what the nature of the palatal noncontinuants in loanwords was at that point in time. For example, modern Polish and modern Kashubian (Footnote A.1) have no phonemic palatal stops ([c ɟ]), although they both possess alveolopalatal affricates ([tɕ dʑ]). Did the WeSl loanwords at Stage Q contain [tɕ dʑ], or perhaps an earlier reflex of those sounds ([c ɟ])? Could [c ɟ] have been present in loanwords from Old Prussian (an extinct Baltic language)? Regardless of how one answers these questions, the point is that loanwords in EaGm referred to here served as a signal to speakers that palatal noncontinuants are sounds distinct from the corresponding velars.

Consider now the connection between the acquisition of loanwords (Stage Q) and the extension of VeFr to velar noncontinuants (Stage R). Stage Q is clearly a sufficient condition for Stage R, because there are many varieties discussed above with the broad set of targets that possess WeSl loanwords. However, it remains unclear whether or not Stage Q is a necessary condition for Stage R.

As noted earlier, not all original sources for EaGm dialects discuss WeSl loanwords, so this question will ultimately need to remain open for further study. Some evidence that there is a direct correlation between the influence of WeSl (which might be deduced on the basis of the sheer number of Slavic loanwords) and the broader set of targets for velar fronting in postsonorant position can be observed in two neighboring EPo varieties discussed earlier (§11.5): Kreis Bütow (with a broad set of targets) and Kreis Rummelsburg (with a narrow set of targets): The source for both dialects (Mischke 1936: 73) notes that Kreis Bütow has more Slavic loanwords than Kreis Rummelsburg ["B.M. [=Kreis Bütow] hat mehr slaw. Lehnwörter als R.M. [=Kreis Rummelsburg]]". In Kreis Schlawe (narrow set of targets), Mahnke (1931: 83) similarly observes that the number of Slavic loanwords is relatively very small ['verhältnismässig sehr gering'].[20] [21]

[20] A potential argument against a necessary connection between Stage Q and Stage R is posed by Kreis Konitz (§11.5). The author of the orginal source (Semrau 1915a: 144) stresses that even though her EPo dialect is surrounded by Polish-speaking communities, there was no comingling of the two languages (['keinerlei Vermischung [hat] stattgefunden])'.

[21] One EPo variety discussed earlier (Lauenburg; Pirk 1928) lists the nativized realization of a small number of Slavic loanwords containing [c] (=⟦kʹ⟧). Those examples are significant because the [c] realization corresponds to [k] in the donor language (Polish), e.g. ⟦borōvkʹə⟧ 'blueberry' < Polish *borówka*. Since there is no evidence that the final vowel in the Polish example was ever front, it appears that speakers of the Lauenburg dialect treat [c] as sound

Recall from §2.4.1 that sound change begins in a focal area and then spreads both temporally and geographically from that point of origin. As pointed out in that earlier section, the focal area is the place where that process has the most general the set of triggers/targets. If this is correct then the implication is that dialects like Reimerswalde in (47) with an expanded set of target segments (all velar consonants) must have been a focal area. This is a possible interpretation, although the role of loanwords suggests that there might be an alternative. In particular, dialects like Reimerswalde might have an expanded set of targets not because they are older than dialects with a narrow set of targets (fricatives) but instead because their speakers had a greater exposure to loanwords. Since there are two conceivable interpretations for dialects like Reimerswalde with a broad set of target segment I do not consider this issue further.

In sum, the emergence of palatal noncontinuants in German dialects once spoken in the east clearly had a structural (phonological) justification, but in all likelihood a social one as well (loanwords from Slavic languages). These two factors therefore provide evidence for polycausality, as described briefly in §2.4.4. As noted in that section, my analysis of the phonemicization of [c ɟ ɲ] in LGm varieties once spoken in the eastern parts of pre-1945 Germany strongly resembles the treatment for the phonemicization of lenis (voiced) fricatives in the history of English ([v z ð]); Ringe & Eska (2013: 142) and Minkova (2014: 91–93) and §8.6.1. The literature on this topic is in agreement that one of the reasons for phonemicization was the occurrence of French loanwords with those sounds. For example, in OE the two fricatives [f] and [v] were allophones, where the latter occurred between lenis sounds (e.g. intervocalically) and the former in the elsewhere case (e.g. word-initially). Minkova (2014) notes that there was an influx of over 800 French loanwords beginning with [v] after the 11th century (in ME) that were not adapted with [f]; this means that there were now minimal pairs involving the inherited (Gmc) [f] and the new [v] in loanwords, e.g. *fēle* 'many' (cf. MoStGm [fiːl]) vs. *vēle* 'veal' (< Old French). Loanwords with intervocalic [f] which failed to surface as [v] were also attested in ME, e.g. *sacrifice* < French *sacrifice.*

11.9 Areal distribution of palatal noncontinuants

This chapter has taken a close look at the phonology of German dialects in which at least one velar noncontinuant serves as a target for velar fronting. It is possible to talk about those targets in more than one way. First, one could draw a

whose distribution is governed by the phonology of Lauenburg. Recall from (33i) that [c] (and not [k]) surfaces before schwa. See Jacobs (1996: 157) for similar examples involving [lʲ] in Central Yiddish loanwords from Polish.

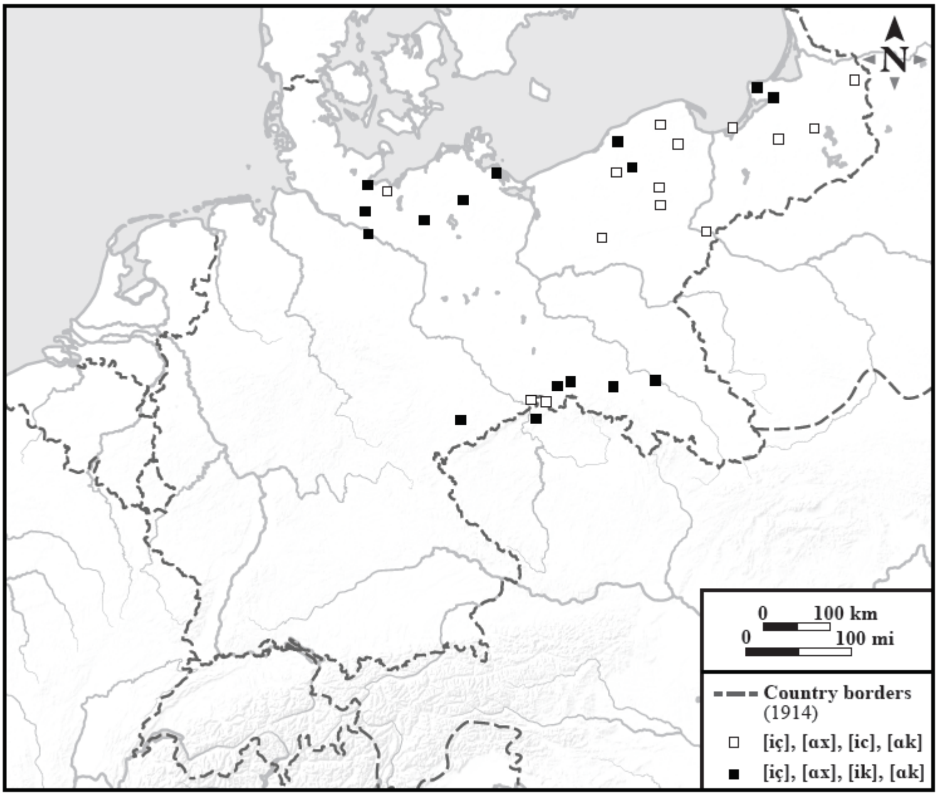
distinction velar fronting targets in word-initial position and postsonorant position. Second, one could classify those varieties in which the palatal noncontinuant outputs of velar fronting are allophones (synchronically derived palatals) vs. those in which the output sounds are underlying palatal noncontinuants (recall 2). Third, one could ask whether or not the output for a target velar stop is itself a stop, or an affricate. Instead of giving a series of tables in which such distinctions are made individually, I simply give one (Table 11.3), which includes all of the relevant studies discussed in this chapter in addition to a few others once spoken in the same region. All of these places are indicated on Footnote 11.3.

Table 11.3: Selection of LGm/HGm varieties in which velar noncontinuants serve as targets for velar fronting in postsonorant/word-initial position

Place	Dialect	Source
West Mecklenburg	MeWPo	Kolz (1914)
Seifhennersdorf	Sln	Michel (1891)
Sebnitz	Sln	Meiche (1898)
Putzig (Posen)	EPo	Teuchert (1913)
Kreis Konitz	EPo	Semrau (1915a,b)
Kamnitz	EPo	Tita (1921 [1965])
Lauenburg	EPo	Pirk (1928)
Kreis Bütow	EPo	Mischke (1936)
Sępóno Krajeńskie	EPo	Darski (1973)
Reimerswalde	HPr	Kuck & Wiesinger (1965)
Alt-Thorn	LPr	Wagner (1912)
Danziger Nehrung	LPr	Mitzka (1922)
Willuhnen	LPr	Natau (1937)
Bieberstein bei Barten	LPr	Tessmann (1966)

All of the sources listed above make it clear that the targets for velar fronting must also include velar noncontinuants even though some authors (e.g. Teuchert 1913) do not give separate symbols for velars and palatals ([k] vs. [c]). In that type of source no conclusions can be drawn concerning the triggers for velar fronting; hence, I do not discuss them further.

One point stressed throughout this chapter is that the more general targets characterized by the varieties in Table 11.3 is not true for other varieties in the same region. This point is made clear in Footnote 11.3, which includes all of the



Map 11.3: Areal distribution of velar noncontinuant targets. Low Prussian, High Prussian, East Pomeranian, Mecklenburgish-West Pomeranian, and Silesian varieties with at least one velar noncontinuant as target for word-initial and/or postsonorant velar fronting are indicated with white squares. Varieties in the same general area in which velar fronting (word-initial and/or postsonorant) targets consist only of fricatives are indicated with black squares.

varieties listed in Table 11.3 (white squares) as well as the varieties in the same area discussed in this chapter where the target for velar fronting consists only of fricatives (black squares).

11.10 Conclusion

This chapter has examined German dialects in which the set of targets for velar fronting consists of velar fricatives like (/x ɣ/) as well as velar noncontinuants (/k g ŋ/). Thus, in contrast to the dialects discussed in Chapter 3-Chapter 10 velar fronting in the case studies investigated in the present chapter has a broader set of targets. It was also demonstrated the original palatal allophones of velar noncontinuants (i.e. [c ɟ ɲ]) can have an opaque history and either quasi-phonemicize or phonemicize (i.e. /c ɟ ɲ/) according to the same paths described in Chapter 7-Chapter 10.

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Name index

Velar fronting in German dialects

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