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DIPLOMARBEIT

Titel der Diplomarbeit

“Ach, ich und die /r/-Vokalisierung.”

On the difference in the distribution of [x] and [ç]

in Standard German and Standard Austrian German.

Verfasserin

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Contents

Abbreviations:

ATR	Advanced Tongue Root
BD	Bavarian Dialects
CBD	Central Bavarian Dialects
ECP	Empty Category Principle
ET	Element Theory
FA	Fricative Assimilation
FEN	Final Empty Nucleus
GP	Government Phonology
IG	Infrasegmental Government
IPA	International Phonetic Alphabet
ISR	Input-Switch Rule
KLV	Kaye, Lowenstamm & Vergnaud
KOeD	Corpus of Austrian German (Korpus Österreichisches Deutsch)
ME	Melodic Expression
MHG	Middle High German
OHG	Old High German
OT	Optimality Theory
PG	Proper Government
PR	Phonological Rule
SAG	Standard Austrian German
SBD	Southern Bavarian Dialects
SG	Standard German
SPE	The Sound Pattern of English (Chomsky & Halle, 1968)
VCP	VC- Phonology
VD	Viennese Dialect

1 Introduction

In this thesis the following observation is investigated: The realizations of the complementarily distributed fricatives [ç] and [x] differ in the context of a preceding vocalized /r/ throughout the German speech community, leading to surface forms such as [d̥ʊɐç] <durch>,'through' in Standard German (SG) and [d̥ʊɐx] in Standard Austrian German (SAG). After considering what the terms SG and SAG refer to, the ample previous literature on the fricative distribution is discussed. Thereafter, [x] is assumed underlyingly, which leads us to surmise an underlying difference in /r/. An analysis is given in the non-branching branches of Government Phonology, i.e. CVCV and VC Phonology. On the way, theory-internal issues on how to treat long vowels and diphthongs are touched.

To give an analysis, the underlying form has to be determined. It goes without saying that many theories of phonology are designed to be capable of deriving only one surface form in one given context. The difference must be detected without theory-driven preconceptions. Therefore, all possible options should be considered. A notation known from rule-based frameworks may help to display the several possibilities upon which a decision can be made. In Natural Phonology, for example, underlying /ç/ is assumed. In this framework, it has to be stated that after the /r/ is vocalized, SG speakers suppress the natural process [ç]→[x], whereas the vocalic counterpart of /r/ changes the fricative from /ç/ to [x] in SAG. This is displayed in (1). In analogy, (2) would be another possibility in Natural Phonology, with the difference of assuming underlying /x/.

(1) [d̥ʊʁç] → [d̥ʊɐç] → [d̥ʊɐx]

(2) [d̥ʊʁx] → [d̥ʊʁç] → [d̥ʊɐç] → [d̥ʊɐx]

Here, either way indicates a hierarchy in the sense that SAG is a modification of SG. Is it a likely scenario to assume that the SAG outcome derives from SG? This question can be answered by investigating the history of standardization. Both, SG and SAG, are based on High German, which is divided further into Central German and Upper German. SG has its base in Central German, whereas SAG is based on Central Bavarian, which is an Upper German variety. On the other hand, SAG is heavily influenced by SG and both are influenced by outdated prescriptive codifications. Nevertheless, another possibility would be to assume a common underlying form for SG and SAG, but differences in the processes applied, as seen in (3).

(3)

	→	[d̥ʊʁç]	→	[d̥ʊʋç]
[d̥ʊʁx]				
	→	[d̥ʊʋx]		

This shows that underlying /x/ is needed to derive the SAG output directly, leading to yet another possibility. What if we have underlying /x/ in SAG and underlying /ç/ in SG? This option, displayed in (4) is taken as a working hypothesis.

(4)

[d̥ʊʁç]	→	[d̥ʊʋç]
[d̥ʊʁx]	→	[d̥ʊʋx]

The previous literature commonly describes the distribution as follows: front vowels and sonorants spawn [ç], back vowels spawn [x], which is true for SG. The diminutive suffix <-chen> and word-initial written <ch> are cited as evidence for an underlying palatal fricative, since they surface as [ç] in prescriptive SG. On the other hand, [x] is its historical predecessor. Therefore, when we have underlying /ç/, we also have a lexical reinterpretation from "[x] → [ç] / X" to "[ç] → [x] / -X" (where "-X" is the complement of the environment "X"). In SAG, word-initial written <ch> is pronounced [k] and <-chen> is not, and never has been, a productive suffix. Moreover, the varieties lacking the distribution, such as Alemannic

and some SBD, use [x] exclusively. Further, certain input-switch rules provide environments leading to [x] more frequently in BD, such as /i/↔/ia/, /u/↔/ua/. These ISRs are dialect markers, i.e. they are not accepted as part of the standard. Even so, since [x] is broadly deployed in Austria, a reanalysis to [ç] → [x] is an unlikely scenario. Hence, underlying /x/ is more probable in SAG and possibility (1) is inapplicable.

The situation in SG, as it turns out, points towards underlying /x/ as well. Word-initial [ç] is a product of prescriptive pronunciation norms and so is /g/-spirantization in the suffix <-ig>. Furthermore, a tendency of [ç] towards [ʃ] is observed in some Central and Northern German varieties, which would leave underlying /ç/ doomed to change both ways. The diminutive suffix <-chen> is productive only in a relatively small area and in that area it also triggers Umlaut. Thus <-chen> puts itself in a palatalizing environment. It may as well be possible that <-chen> is lexically frozen, since new words formed with this suffix are very rare. Due to these observations, the working hypothesis (4) is rebutted, which leaves the possibilities (2) and (3).

The question is now whether /r/ serves as a palatalizing environment in BD and subsequently in SAG. One argument for /r/ being a palatalizing environment is the change from SG [s] to [ʃ] in some High German varieties, such as <Wur[s]t> - <Wur[ʃ]t>. However, prescriptive SG codification is to thank for that, since these spirant-plosive clusters were pronounced with the palatoalveolar fricative in High German, before Low German sound values were added to the codification. Moreover, in CBD and SAG the low offglide [ɐ] is not only product of /r/-vocalization, but also the default, just like [ə] in SG. Additionally, some BD have an intrusive /r/, indicating that /r/ in these varieties behaves in a more glide-like way. Hence, the palatalizing detour, as proposed in (2), is an unlikely scenario. Before settling for (3), another possibility has to be considered. Since intrusive /r/ is an option, at least in some BD, /a/ rather than /r/ may be the underlying form. This view can be discarded because in BD and SAG, [ɐ] precedes every /r/ which surfaces intervocalically (though not when it is

preceded by a consonant or a diphthong). This can be seen in examples like SAG [fiːb̥ɐ̯]-[fiːb̥ʁɪg̊] <Fieber>-<fiebrig> 'fever' (noun/adj.) and [b̥aɛ̯ɐ̯]-[b̥aɛʁɪʃ] <Bayer>-<bairisch> 'bavarian' (noun/adj.). If intrusive /r/ were the decisive process, these examples would surface as *[fiːb̥ɐ̯ʁɪg̊] and *[b̥aɛ̯ɐ̯ʁɪʃ]. All evidence points towards a difference in /r/, as seen in (3). Not only is /r/ rich in phonetic interpretations in the languages of the world, but in most parts of the German speech community it recently underwent a sound change from alveolar to uvular. I would argue that phonological processes shape the underlying representations in first language acquisition, causing different interpretations of /r/.

For a GP analysis, this means that /r/ consists of |A| in BD and SAG, but |I.A| in SG and Northern and Central German. The |I| element enriches the melodic expression of [x] |U.H| to |I.U.H|, which surfaces as [ç]. The more glide-like behavior of /r/ in CBD is an additional indicator for analyzing /r/ as a simplex melodic expression in these varieties. Special attention is devoted to the examples [fiːb̥ɐ̯]-[fiːb̥ʁɪg̊] <Fieber>-<fiebrig> 'fever' (noun/adj.) and [b̥aɛ̯ɐ̯]-[b̥aɛʁɪʃ] <Bayer>-<bairisch> 'bavarian' (noun/adj.) mentioned above, as they bear certain insights into the differences between diphthongs and monophthongs in contrast to long vowels.

The thesis is organized as follows: Section 2 deals with the sociolinguistic perspective. First the classification of SAG is discussed, which includes consideration of the dialectal landscape in Austria, implications drawn from understanding German as a pluricentric language, the necessity of codifying Standard Austrian German and the influences of outdated pronunciation norms still in use today.

Section 3 is dedicated to the phenomena. The dorsal fricative distribution is outlined in 3.1, where the previous literature is discussed, while the distribution in SG and its colloquial varieties is shown. Later the situation in Austria is enlarged upon. Subsection 3.2 concerning /r/ and /r/-vocalization is organized in a similar fashion. After /r/ has been discussed cross linguistically, the situation in Germany and Austria is highlighted.

Thereafter a conclusion is drawn upon the data, to avoid a theory-driven analysis. Section 4 and 5 are dedicated to an analysis in the non-branching flavors of Government Phonology. Section 4 contains descriptions of Element Theory and the structural representations in CVCV and VC Phonology. Finally, in section 5, an analysis in these frameworks is given.

2 Sociolinguistic aspects

Before diving into the sociolinguistic aspects, a few notes have to be given on the usage of certain terms. In German, the term *Hochdeutsch* (High German) is ambiguous. On the one hand, the term is used to denote codified present-day Standard German. In common usage, the term is applied to a very formal speech style, i.e. when someone 'talks as it is written' ("nach der Schrift reden"). On the other hand, *Hochdeutsch* labels the geographic region and stands in opposition to *Niederdeutsch* (Low German). In other words, Low German is spoken in the north and *High German* is spoken in the "higher", more alpine regions of the south. At times, one may also find the term *Oberdeutsch* (Upper German), labeling Southern High German, in opposition to Central High German. Upper German includes Bavarian, Alemannic and High Franconian. Central (High) German may be divided further into Western and Eastern Central German.

The term *High German* includes a wide range of geographic varieties and historical varieties going back more than a thousand years. The ambiguity of the term lies in its history, since codification of Standard German was originally based on High German. Hence, in colloquial usage, *Standard* and *High* became synonymous. Problems arise with terms such as *Mittelhochdeutsch* (Middle High German). *Mittelhochdeutsch* refers to the period in the history of German between approximately 1050 AD and 1350 AD; but as seen above, Middle High German is not to be confused with the High German variety spoken in the central area of Germany. This variety is called *Mitteldeutsch* (Central German), and an early standard of High German was based upon it. Again, *Middle* is used in contrast to *Old* and *Modern,* to refer to diachronic divergences of the German language. *Central* refers to geographic regions and *Standard* indicates codification.

2.1 Standard Austrian German

German is a pluricentric language. It is the sole official language in Germany, Austria and Lichtenstein, co-official language in Switzerland and Luxemburg, and a minority language in Belgium, Italy and France. Pluricentric languages are characterized as having more than one center of development with internal norms and variants (Clyne 1992). These centers belong to the different regions or nations where the status of the language is official, co-official or acknowledged as a minority language (Muhr 1993). If one national variety equals one center of development, the language can be characterized as plurinational (Ammon 1996).

> Die Plurinationalität des Deutschen kommt nicht nur darin zum Ausdruck, daß die hier zur Diskussion stehenden Varietäten auf die verschiedenen Deutschsprachigen Nationen verteilt sind, sondern noch prägnanter darin, daß zumindest manche dieser Nationen ihnen große Bedeutung für ihre nationale Identität beimessen. (Ammon 1996:132)

Ammon (1996) points out here that the plurinationality of German is not just expressed by the fact that the varieties are distributed across the different German-speaking nations, but more concisely, that at least some nations attribute great importance to their language varieties for their national identity. By pointing out the importance of a codified standard for the national identity of a state, Ammon indicates an asymmetric ranking of different regional standards. This asymmetry can be caused by the size and coverage of a center, the number of inhabitants, or economical and political influence. According to Clyne (1992), speakers of dominant varieties, ("d-varieties"), usually confuse regional standards with dialectal variation, and therefore see their standard as the 'one correct standard', and disclaim the pluricentric nature of their language. In the German speech community, the dominant center is Germany, or more precisely North and Central Germany.

> [...] Germans will make much less effort to converge when they are in other

> German-speaking countries than they themselves require of other German speakers. West Germans' attitude to the other national varieties tends to be one of romantic affection for the exotic. (Clyne 1992:139)

The key for acknowledgment and acceptance as an equal national variety is codification. In Austria, the effort of codifying its standard is far from done. Moreover Ehrlich (2009) points out that a *full center* ("Vollzentrum") has to have officially valid codification in every level: grammar, lexicon and pronunciation, to be classified as a full center. Hence Austrian German cannot be defined as a full center yet, as it does not have a state-official orthoepic dictionary.

> Jedoch impliziert ein Vollzentrum auch eine amtlich gültige Kodifikation in allen Bereichen der Sprache, also Grammatik, Lexik und natürlich auch Aussprache, was zumindest für Österreich nicht der Fall ist, [...] weil eine Aussprachekodifikation [...] vorausgesetzt werden müsste, um per definitionem als Vollzentrum zu gelten. (Ehrlich 2009:46)

The fundamental step towards acknowledgment and acceptance as national variety of equal status, next to Standard German and Swiss German, Austrian German needs codification that is not just different in some aspects from Standard German, such as certain lexical terms, to strengthen its autonomy. Therefore empirical and descriptive studies are important to provide the basics that can lead to textbooks, dictionaries, codes of pronunciation, coherent usage in the media, less confusion in translating Austrian politicians, awareness of differing standards in teaching German as a foreign language, and so on.

Politically, Austria is an independent nation, but linguistically very close to Germany, and it has vacillated between identifying itself as a nation in international politics on one hand and adjusting to the politically and economically more powerful neighbor on the other (Clyne 1992).

It has to be emphasized, however, that dialectal boundaries deviate from national ones. Therefore the term 'national' does not capture every significant area influencing a regional standard. Scheuringer (1996) points out that nationality is only one potential area of

development for a recognized variety. Since areas related to the Old Bavarian Austrian area, or the entire Southern German area, are more common than areas related to national ones.

> Gerade in bezug auf die deutsche Standardsprache in Österreich sind Räumlichkeiten, die z.B. einen altbayrisch-österreichischen Raum ergeben, oder solche, die einen gesamtsüddeutschen Raum zeigen, weitaus häufiger als staatliche [...]. (Scheuringer 1996:152)

Ammon (1996) admits that due to their political significance national varieties are often considered more important than regional ones, but German is a pluriregional as well as pluricentric language.[1] Thus knowledge of both types of differentiation, national and regional, are relevant for successful communication in the German speech community.

> Für die erfolgreiche Kommunikation in der deutschen Sprachgemeinschaft sind jedenfalls Kenntnisse beider Arten von Differenzierung, der nationalen wie der regionalen, bedeutsam. (Ammon 1996:136)

Individuals may feel more comfortable using the standard that is closest to their dialectal base, even though their national boarders diverge from the dialectal ones. In other words, citizens of Bavarian Germany may prefer Standard Austrian German due to their Bavarian roots, or citizens of Vorarlberg may prefer Standard Swiss German due to their Alemannic roots. Of course, this is impossible without acknowledgment of regional standards as equals.

In order to codify a national standard, knowledge of regional varieties is required. The question is now how to use this knowledge to establish a standard variety, which is to be accepted as a norm. A few more statements might clarify this.

A standard is highly influenced by its related dialects, especially on the level of pronunciation, as the phonemic level is very stable (Kelle 1995). Moreover speakers can be attributed to their regional variety due to their sound pattern (Clyne 1995). Thus this has to be accounted for in the process of Codification of Standard Austrian German. Due to the rich dialectal landscape, caution is demanded to distinguish between used as well as accepted

1 The term *pluriregional* was suggested by Scheuringer (1996); Wolf (1994) uses the term *pluriareal*.

standard entities and regional dialectal variants. Furthermore, every user of a national variety has to be comfortable with its norms, regardless of their dialectal background. Therefore every dialect marker has to be left out of a standard norm and the remaining parts have to form a universally valid codified national standard (Moser 1995). In summary, it can be said that speakers of a regional/national standard have to accept its norms in order to be comfortable using it.

Wiesinger (2009), among others, suggested basing the description of Standard Austrian German on trained speakers, such as newsreaders or actors, as their language is broadly accepted all around Austria. The main argument for working with people who are trained in speech style and pronunciation is that they got rid of their dialectal influences during their training and therefore are the ideal standard speakers or model speakers.

Herein lies a fundamental circularity, as the instructions which trained speakers are educated with are based on prescriptive codifications that were set when the monocentric idea of a unified German high level pronunciation was taken for granted. Besides, the language present in the media has an influence on the comprehension of 'proper' German. Hence the enforcement of outdated codifications contributes to maintaining the monocentric view. Moreover, analyzing data strongly influenced by rules of pronunciation will most likely spawn results similar to the rules that the trained speakers have internalized. Thus orthoepic dictionaries have no chance to improve as realistic representations of the language used in a specific area.

The most influential codification is known as *Siebs*. In 1898, Theodor Siebs suggested the first unified *German stage pronunciation* (Deutsche Bühnenaussprache), which is based on Low German phonetic values. It was institutionally supported and officially accepted. Before Siebs, the German standard pronunciation was mainly affected by the Eastern Central High German variety of Upper Saxony. Later Siebs' rules were established as a universally valid norm for formal speech and language education. In 1922 the book was given the additional

title *standard speech* (Hochsprache). Ehrlich (2009) points out that Siebs was criticized for being out of touch with reality, and that the rules were designed for *clarity* and *long-distance effectiveness* (of transmission of speech) rather than for communicating privately in confined spaces.

> [...] es zeigte sich sehr früh, dass die Ausspracheregeln wegen ihrer realitätsfremden Kodifizierung kaum in die Praxis umgesetzt werden konnten. Die Bühnenaussprache war aufgrund ihrer Beschaffenheit auch mehr auf "Wortdeutlichkeit" und "Fernwirkung" ausgerichtet, weil es ja nicht darum ging, „in kleinen Räumen von Mensch zu Mensch zu kommunizieren“[...]. (Ehrlich 2009:28-29)

She further states that stage pronunciation is based on trained, breath-supported, powerful voices one might acquire through elocution and vocal training, but its application to colloquial speech causes difficulties.

> Die Bühnenaussprache basiert vielmehr auf dem Gebrauch der trainierten, atemgestützten Kraftstimme, die man sich im Rahmen einer sprecherzieherischen und stimmlichen Ausbildung aneignet, und deren Anwendung in der Alltagssprache durchwegs Probleme bereitet. (Ehrlich 2009:29)

To account for all of this, attempts were made to derive rules for 'reduced' usage from the previous ones. The original rules were still considered the most accurate; but nevertheless, Austrian variants were taken into account with “Österreichisches Beiblatt zu Siebs” ('Austrian supplement for Siebs'), published in 1957, to introduce varying rules for educational purposes. Hereafter the 19th edition 1969 was amended by adding non-Low-German variants. This split of 'pure' (“reine”) and 'moderate standard pronunciation' (“gemäßigte Hochlautung") was praised, because finally other varieties were taken into account. On the other hand, this split was criticized for indicating a fictional heterogeneity of the German language (Ehrlich 2009).

2.2 Summary

In this section the nature of German as a pluricentric language was outlined. On its way to becoming an equal national variety, Austrian Standard German needs orthoepic codification. Reiffenstein (1983) concludes that a definition of standard depends on political, rather than dialectal borders. Hence SAG codification has to capture reality, in the sense that speakers of different regional varieties have to be comfortable with their standard. Codified rules must not be unachievable. On the other hand, dialect markers have to be identified and left out of a codification. Additionally, SAG has to be a standard in its own right, without the constant need for justification vis-à-vis dominant Standard German. Thus, awareness of highly influential, prescriptive Standard German codifications is demanded. In the following section the dialectal situation in Austria is investigated.

2.3 Dialects in Austria

Basically, Austria is divided into two major dialect groups: Bavarian and Alemannic. The former is further divided into i) Central Bavarian, including Vienna, Upper and Lower Austria, and ii) Southern Bavarian, including Carinthia, the central part of Northern Tyrol, Eastern Tyrol, and Southern Styria. Salzburg, the eastern part of Northern Tyrol, most of Styria, and Burgenland are classified as iii) Southern Central Bavarian. The western part of Northern Tyrol is categorized as iv) Southern Bavarian with Alemannic influence. Finally, v) Alemannic is spoken in Vorarlberg.

In a socio-phonological study, Moosmüller (1991) showed that different centers of development of SAG can be distinguished in Austria. Most broadly accepted is the standard based on the Central Bavarian variety that is spoken by people of higher education.[2] Conspicuous dialectal attributes as well as Southern Bavarian characteristics are ruled out as unacceptable. Her acceptance tests revealed that Southern Bavarian speakers suppressing dialectal markers were assigned to the categories *supraregional* ("überregional") or even *Vienna* ("Wien") and not to a regionally defined standard. Additionally her work showed an uncertainty in understanding 'standard' in Austria. When people were asked directly, they wished for an acknowledgment of different regional standards. For example, speakers of Southern Bavarian varieties feel discriminated by speakers of the dominant Central Bavarian variety spoken in Vienna. Conversely, when given the acceptance tests, the same Southern Bavarian speakers would not classify their variety as standard material. Hence, again, the most accepted base for Standard Austrian German is Central Bavarian. In other words, SAG has to

2 Moosmüller treats the language of media broadcasting as a distinct variety, as the major broadcaster in Austria (ORF) has its own norm, which deviates considerably from the language of other sections of the population (Moosmüller 1991:180).

sound Austrian, i.e. needs to differ from Standard German, but must not sound Southern Bavarian or Alemannic.

Thus, to leave dialect markers out of a standard codification, one has to define what qualifies as a dialect marker. On a phonemic level, dialects are characterized as follows: First of all, phonological differences are usually systematical, i.e. apply whenever the right context is given. Dialects are related and dialectal variation is gradual and continuous. The dialectal systems that a single speaker operates with are polar and finite, but they do not have to be homogenous or complete (Dressler & Wodak-Leodolter 1978, Dressler & Wodak 1982, Rennison 1981).

More often than not, these characteristics are interpreted as follows. Consider the example <legen> 'to put'. In Central Bavarian varieties, the gradual assimilation would be [leːg̊ɛn] – [leːg̊ŋ] -[leːn̥], where all three are possible surface forms.[3] They are polar in the sense that [leːn̥] is the most causal one and [legɛn] the most formal form. There is one possible intermediate stage [leːg̊ŋ], thus the system is finite. Not every speaker of a dialect expresses every given possibility or uses the same state of reduction or assimilation. Hence inter-individual and intra-individual differences exist and they depend on social parameters and psychological factors.

This kind of analysis yields practical as well as theoretical inadequacy. In classifying standard-dialect interaction as nothing but a gradual scale, a certain unwanted hierarchy is implied, where it looks like dialect is nothing but some sort of sloppy pronunciation. Of course, this is not the case. A dialect may be more innovative, whereas a standard is frozen in the sense that its codification inhibits changes on a higher degree. Clyne (1992) states that fluid diglossia is present throughout large parts of Austria and Southern Germany. Again, every dialect speaker in Austria has a certain knowledge of an Austrian standard, and every SAG speaker also possesses a certain knowledge of Austrian dialects. Moreover, standard-dialect

3 In Northern Germany gradual reduction would look more like [leːg̊ɛn] – [leːg̊ən] – [leːjən].

interaction, i.e. switching between both varieties, is used as a speech style. Thus speakers have direct access to more than one system, where every one of these systems is polar and finite. Switching between these is systematical, but this need not be reflected consciously. In the next section, two models, dealing with dialectal variation, are discussed. These two models agree on the characteristics mentioned above, but handle the systematic switching rather differently.

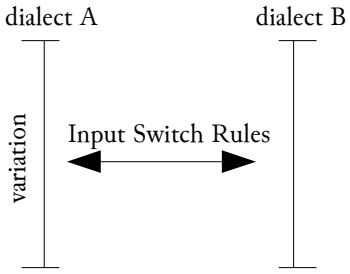
2.4 Input-Switch Rules

Dressler & Wodak (1982) and Wodak-Leodolter & Dressler (1978) presented a socio-phonological approach for dealing with bi-dialectal or multi-dialectal competence and showed this on the basis of Viennese speakers in the framework of Natural Phonology. The principle idea is to acknowledge fluency and competence in at least two levels of dialectal variation where code switching can take place freely (i.e. as needed). They postulate that every Viennese speaker has at least two phonemic systems, one being Viennese Dialect (VD) and the other one Standard Austrian German (SAG).

They acknowledge the lack of direct correlation between linguistic and sociological factors, but macro-sociological categories have an impact on the employment of certain phonological variables in specific contexts (Dressler & Wodak 1982: 352).

In the framework of Natural Phonology, these two underlying representations are understood as two different intentions in which actual surface forms are derived by obligatory phonological rules (PRs). Every PR belongs to one of two process types; fortition processes or lenition processes. The former deals with clarification, i.e. serving or enhancing perceptibility, the latter is also called obscuration, and serves or enhances ease of articulation. These PRs, reflecting predetermined or natural phonological processes, explain the graduality of dialectal variation within one system as seen in the *legen* example. Conversely bidirectional input-switch rules apply whenever there is an absolute switch of systems or socio-phonological intention. This theory is visualized as a simplified diagram in (5). Processes, PRs, apply within one phonemic inventory, shown as the horizontal axis, whereas rules, ISRs, are the link between the two inventories, indicated by the vertical axis.

(5)



The reason for the need for ISRs is a matter of distinct diachronic development. One example for an ISR is the Middle High German long [ī], which became [aɛ] and coincided with MHG /ei/ in SG. In BD, on the other hand, MHG /ei/ became [ɔa], and [aː] in VD respectively. Thus there is a disparity between, for example, SG <weiß> 'white' and <weiß> 'know' (1st person sg.), where 'know' is pronounced [waːs] / [wɔas] and the color 'white' surfaces as [waɛs] in BD.

Furthermore production and perception of ISRs can be controlled better than PRs and might be stigmatized more easily (Dressler & Wodak 1982). They enumerated a number of input-switch rules for VD, which might either be general, given the right context, as shown in (6a) or idiosyncratic and lexically restrained, as the ones in (6b).

(6)

	SG		VD	context	examples
a.	ae	↔	aː		<breit> 'broad'
	ao	↔	aː	preceding /m/	<Baum> 'tree'
	ʏ, y	↔	iː, i		<hübsch> 'pretty'
	œ, ø	↔	eː, e		<schön> 'beautiful'
	ɔe	↔	æː		<heute> 'today'
	a	↔	ɔ		<Vater> 'father'

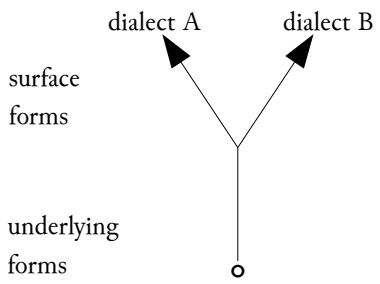
b.	iç	↔	iː	<ich> 'I'
	aox	↔	aː	<auch> 'also'
	ist	↔	iːz	<ist> 'is'
	niçt	↔	ned	<nicht> 'not'
	sind	↔	san	<sind> 'are'

This theory shows that processes, and input-switch rules are two entirely different aspects of dialectal variation. Dressler & Wodak (1982) assume redundant storage in the lexicon, i.e. two complete phonemic systems for each variety. One doesn't need to feel comfortable with the functionalist approach the framework is set in to acknowledge that ISRs relate to different but similar phonological systems, understood as distinct from phonetic variability.

For his SPE analysis of the city dialect of Salzburg, Rennison (1981) proposed a different model, the *Auswahlmodell* ('selection model'). In this model distinct forms for the two polar varieties are stored if needed, but usually there is a single lexical form. Selection of PRs takes place on the way to the surface by means of a "variety feature" that can switch from standard to dialect once during a derivation (but cannot switch back). This does not mean that speakers select their variety actively or consciously. Rennison argues for the classical generative split between competence and performance. The fact that dialect speakers can understand a lot more dialects than they can actively produce shows that difference. Competence refers to the knowledge of grammar and it can be taken to be responsible for intuitions on what is grammatical and what is not.

On the other hand, comprehension, which is not part of a speakers competence, is done by performance strategies (Rennison 1981:41). Performance also comprises the social level of speech, which has to be excluded from the abstract theory of phonology. This Auswahlmodell is shown in (7).

(7)



In this thesis I want to argue for merging both models. Since later on a GP analysis is given, standard-dialect interaction has to be understood in generative terms, where the formalisms should be as minimal and economical as possible. The selection model is build on the idea of not splitting up the lexicon, but letting performance decide on the path. The two-competence model displays the difference between gradual variability and the more conscious input-switching. Therefore, ISRs are understood here as part of the speaker's competence, even though their application is a performance strategy. In other words, phonological processes operate in a restricted domain. Outside this domain, regular patterns can be found, both within the lexicon of a single language and across language varieties, that can be captured as ISRs, or 'correspondence rules' (Auer 1993). The term ‘correspondence rule’ illustrates the multidimensional approach to capture microvariation systematically. Again, a set of patterns can be employed to ‘understand’ the forms of another variety, even though there is no synchronic linguistic connection between the given varieties.

2.5 Summary

In this section standard-dialect interaction in Austria was discussed. The need to codify SAG was emphasized. In order to do that, SG influences as well as outdated prescriptive rules, which still live on in the media due to their usage in speech training, have to be omitted from a SAG codification. Additionally, dialectal influences need to be understood, and

stigmatized dialect markers need to be detected, to leave them out of a SAG norm as well. The majority of Austrians are diglossic, i.e. are consciously aware of a standard-dialect correspondence, at least in certain domains. To understand this interaction, two models dealing with standard-dialect correspondence were discussed. It was shown that microvariation can be understood through incorporating *input-switch* or *correspondence* rules into the lexicon. Furthermore, this multidimensional approach might reshape our understanding of phonology.

3 Phenomena

In German [ç] and [x] are in complementary distribution, i.e. the preceding vowel or sonorant consonant[4] influences the choice of allophone. In Standard German, [x] surfaces after back vowels, [ç] everywhere else, including word-initial and morpheme-initial positions. This has been described copiously in the phonological literature since the late 1920s. This distribution holds in most of the German varieties spoken in Germany. However, in Standard Austrian German as well as the related Central Bavarian dialects, [x] also surfaces after vocalized /r/, which leads to surface forms like [kiɐxɛ] <Kirche> 'church'. The corresponding surface form in Standard German would be [kɪɐçə]. This has rarely been taken into account in analyzing the phenomenon. Moreover, one context producing opposite outcomes in different varieties of a language is a challenge for every phonological framework, as a given model is usually designed to explain the one and rule out the other. This section aims to give an insight on how to deal with this problem.

3.1 The Dorsal Fricatives

The complementary distribution of the palatal fricative [ç] ('ich-Laut') and the velar fricative [x] ('ach-Laut') is a textbook example of German phonology. It has to be mentioned that the previous literature has almost exclusively dealt with Standard German and, more or less, related Northern and Central German dialects.

The previous literature is pervaded by the following question: Which of the allophones is the underlying form and which is derived? Since this question seems to be an ongoing one, the

4 Due to constraints on syllable structure, obstruents never occur before [ç]/[x] except across a morpheme boundary – cf. the discussion of <-chen> throughout this thesis.

first hypothesis that comes to mind is whether different underlying forms in different varieties are possible. In order to test this hypothesis the previous literature has to be reviewed to get a picture of the arguments for and against a given underlying form, while turning one's attention to a separation of data-driven arguments from theory-driven ones. Moreover the previous literature is enriched with descriptions of related phenomena in the dialectal landscape of Germany, such as /g/-spirantization, that have to be taken into account and compared to similar contexts in the Central Bavarian dialect area and Standard Austrian German.

3.1.1 The Dorsal Fricatives in Germany

The Standard German pattern for this allophony is strait forward and entirely predictable. [x] appears after back vowels, [ç] everywhere else. The following table (8), adapted from Hall (1989), illustrates this distribution. Note that there is a third sound involved in this distribution. The uvular fricative [χ] is found after [a] and optionally after [ʊ] and [ɔ]. Robinson points out that "given its distribution, [the uvular fricative] actually has more right to the name of ach-Laut." (Robinson 2000:15). This variant of the sound written <ch>, however, is treated as a surface form derived by a phonetic process, i.e. a uvularized variant of the velar fricative [x] (Wiese 1996, Robinson 2000) and is therefore not shown in in the table below.

(8)

	[ç]			[x]	
a. postvocalic					
ich	['ɪç]	'I'	Buch	['b̥uːx]	'book'
Pech	['pɛç]	'bad luck'	Spruch	['ʃb̥ʁʊx]	'saying'
Gespräch	[g̊ə'ʃb̥ʁɛːç]	'conversation'	Koch	['kɔx]	'cook'

	reich	['ʁaɛç]	'rich'	hoch	['hoːx]	'high'
	euch	['ɔɛç]	'you' (familiar pl.)	Hauch	['haɔx]	'breath'
	Gerücht	[g̊ə'ʁʏçt]	'rumor'	nach	['naːx]	'after'
	Wöchnerin	['ɣ̊œçnəɐʁɪn]	'woman in childbed'	Bach	['bax]	'creek'

b. syllable-initial

riechen	['ʁiçən]	'to smell'	Buche	['b̥uːxə]	'beech tree'
sicher	['sɪçɐ]	'sure'	Bruche	['b̥rʊxə]	'medieval underpants'
lächeln	['lɛçəln]	'to smile'	Knochen	['knɔxən]	'bone'
schmeicheln	['ʃmaɛçəln]	'to flatter'	rauchen	['ʁaɔxən]	'to smoke'
keuchen	['kɔɛçən]	'to pant'	Sprache	['ʃb̥ʁaːxə]	'language'
Flüche	['flyːçə]	'curses'	machen	['maxən]	'to do, make'
Löcher	['lœçɐ]	'holes'			

c. [ç] after sonorants, both tauto- and heterosyllabically

Dolch	['d̥ɔlç]	'dagger'	solche	['zɔlçə]	'such'
manch	['manç]	'many a'	mancher	['mançɐ]	'many a' (masc.)
durch	['d̥ʊʁç]	'through'	schnarchen	['ʃnaʁçən]	'to snore'

d. [ç] word-initially[5]

Chirurg	['çiʁʊɐ̯g̊]	'surgeon'	Cholesterin	[çolɛstɛ'ʁiːn] 'cholesterol'
Chemie	[çe'miː]	'chemistry'	Charisma	[ça'ʁisma] 'charisma'

5 More is to say about the dorsal fricative behavior word-initially. The examples exemplified here are what pronunciation dictionaries postulate. Further discussion follows below.

Neither the length nor the tenseness of the preceding vowel has an impact on the choice of the fricative. Furthermore word-internal syllable-structure does not constrain this fricative assimilation. Affixation and compounding on the other hand break the allophony. Moreover one could expect the assimilation in external sandhi positions too, but this is not the case in SG, as can be seen in (9) (Noske 1997).

(9)	Biochemie	[bioçe'miː]	'bio chemistry'
	weil du Chemie studierst	[...duː çemiː ...]	'because you study chemistry'

The well-known minimal pairs in (10) show the difference between the behavior of root-internal dorsal fricatives and the SG diminutive suffix <-chen>. To account for this blocking of dorsal fricative assimilation after certain boundaries was the main goal of every previous analysis.

(10)	tauchen	['taɔxən]	'to dive'	Tauchen	['taɔçən]	'little rope'
	pfauchen	['pfaɔxən]	'to hiss'	Pfauchen	['pfaɔçən]	'little peacock'
	Kuchen	['kuːxən]	'cake'	Kuhchen	['kuːçən]	'little cow'

In this section previous attempts of phonological analyses are outlined. The literature may be divided into early and recent literature. The discussion of dorsal fricatives in the early literature was closely linked to the mission of defining phonemes, whereas in the more recent literature the phenomenon is analyzed in different frameworks. There are a lot more analyses out there than can be presented here, of course; the present selection was made to highlight differing frameworks and to reveal the broad range of possibilities of looking at the given data.

3.1.1.1 <-chen>

As already mentioned, the suffix <-chen> has played a crucial role for the question whether [x] and [ç] should be seen as two separate phonemes or as allophones of one phoneme.

Since almost every more recent analysis refers to Bloomfield (1933 [1970]), let us start there. Bloomfield (1933 [1970]) is a direct answer to Jones (1929), who defines phonemes due to differentiation pursuant to phonetic processes rather than their reference to meaning, counter the structuralist tradition. Hence it is not surprising that Jones analyzes [x] and [ç] as separate phonemes in German.

> An important point to note is that the phoneme is essentially a phonetic conception. The fact that certain sounds are used in a language for distinguishing the meanings of words doesn't enter into a definition of a phoneme. It would indeed be possible to group the sounds of a language into phonemes without knowing the meanings of any words. (Jones 1929:43)

We see here that as early as the late 20s attempts were made to define *phoneme* (and *morpheme*, too) without relying on the fundamentally arbitrary form-meaning correlation, which was never discussed properly in structuralist linguistics (Allan 2003).

Furthermore Robinson (2000) writes that Jones "does not allow himself to recognize" (Robinson 2000:22) the overlap in the distribution produced by <-chen> in terms of morpheme boundaries.[6] But due to strict inductivism, the goal of structuralist linguistics, an analysis based on morphosyntactic boundaries is unwelcome. So maybe Jones saw no other possibility than stating two separate phonemes to avoid relying on meaning on the one hand and boundaries on the other.

Bloomfield (1933 [1970])[7] does not challenge Jones' phoneme definition as such, but argues for treating <-chen> as a separate word with secondary stress, even though "the word is not

6 Jones' examples are [rɑʊxən], [frɑʊçən] and [kuːxən], [kuçən] (Jones 1929:43-44).

7 Bloomfied's article is written in IPA, therefore the Latin transliterations of his quotes are my own.

in principle a phonetic entity." (Bloomfield [1970]:195). Here, in order to include the <-chen> examples, Bloomfield had to analyze <-chen> as a domain in its own right – a morpheme. Additionally he argues that <-chen> is pronounced with [ɛ] rather than [ə], as consonant initial suffixes never contain [ə]. Here claims had to be made concerning the nature of <-chen> that rule out variation differing from Standard German. In addition, the standard's exegesis is clearly theory driven. The crucial passage for almost every more recent analysis is the following. He states that "x (after a, o, u, aw of the same word) is merely a variant of the phoneme ç (in all other positions)."(Bloomfield [1970]:195). Here lies the ground stone in the principle idea of having one phoneme in complementary distribution with the underlying form /ç/.

Trubetzkoy (1939), again, analyzes the appearance of [ç] in <-chen>, or, more precisely, [ç] following a back vowel, as an aphonematic group-boundary signal, notifying a morpheme boundary.[8] In his examples <machen> 'to make' vs. <Mamachen> 'Mum' (dim.) the transcription he uses for the unstressed vowel is schwa [ə], not [ɛ].

> [...] ist in machen das x velar, weil es zu dem selben Morphem wie a gehört (max-ən), aber in Mamachen ist x palatal, weil zwischen ihm und a eine Morphemgrenze liegt (mama-xən). Somit ist im Deutschen die palatale Realisation von [...] x nach einem hinteren Vokal ein aphonematisches Gruppengrenzsignal. (Trubetzkoy, 1939:249)

Arguably, Trubetzkoy's framework differs significantly in his usage of boundaries. Thus the problem remains. Working strictly inductive while relying on boundaries is unachievable, but by allowing [x] and [ç] to be surface forms of one single phoneme, morphological information has to be included in phonology. This discussion was still ongoing in the late 50s, as seen in Trost (1958), who states explicitly that "[w]hether these two sounds are to be considered separate phonemes or allophones of a single phoneme depends entirely on

8 For a more detailed discussion, cf. Robinson (2000).

whether one admits phonically unmarked morpheme boundaries into the phonemic description." (Trost 1958:243).

The question should rather be, whether <-chen> is reliable data. Robinson (2000) argues that the suffix <-chen> is not native in every area of the German speech community and therefore has no place in the phonologically derived fricative distribution.

As mentioned above, the diminutive suffix <-chen> is not affected by the progressive assimilation process. The widely known minimal pairs that were shown earlier in (10) are repeated for convenience in (11). In the last row an example is mentioned which is considered truly homonymous.

(11)	tauchen	['taɔxən]	'to dive'	Tauchen	['taɔçən]	'little rope'
	pfauchen	['pfaɔxən]	'to hiss'	Pfauchen	['pfaɔçən]	'little peacock'
	Kuchen	['kuːxən]	'cake'	Kuhchen	['kuːçən]	'little cow'
	eichen	['aɛçən]	'to calibrate'	Eichen	['aɛçən]	'little egg'

This phenomenon is usually analyzed as the progressive assimilation not taking place over morpheme boundaries. It is hard to prove otherwise, as <-chen> is the only Suffix with the shape of an initial dorsal fricative followed by a vowel, or schwa in some dialects. Note that <-chen> usually triggers Umlaut, or at least did so diachronically. Therefore the first three examples in (11) are exceptions. Moreover they seem constructed to fit the purpose. Especially ['kuːçən], <Kuhchen> is often militated against. Natives tend to prefer the umlauted version ['kʏːçən] and commonly add that they wouldn't use the word at all, as the word <Kalb> 'calf' is preferred, which is umlauted regularly when <-chen> is attached: <Kälbchen>.

Robinson (2000) gives an overview of the diachronic development of <-chen>, and the other diminutive suffix <-lein>, which will be outlined here shortly. The ancestors of these suffixes

where very much alike: <-chen> corresponds with MHG <-iko>/<-ikîn> (-iko + -în) and <-lein> corresponds with <-ilo>/<-ilîn> (-ilo + -în).

The [k] in <-ikîn> underwent the High German Consonant Shift. Hence it changed into [x]. Due to the preceding high vowel, the palatal assimilation process turned the sound into [ç]. In areas, where <-chen> is native, the vowel reduced to [ə], as "[f]amilarity breeds reduction" (Robinson 2000:66). The native <-chen> underwent further development to [ʃən], in Eastern Central German, [ʃə] and [çə] in West Central German, and rarely occurred as unshifted -ken, -ke in the north, whereas <-lein>, as the native suffix in the south, synchronically corresponds to dialectal diminutive forms like [ɐl], [əl], [lî], [lə] and the like. In these non-native areas, <-chen> is borrowed from literary language. He further reasons that "[i]t seems not at all unlikely that under such circumstances the initial [ç] of the suffix would stand out as something requiring a special lexical marking. Like the cases of [ç] [... in] loanwords, it is different from the [ç] found automatically after certain vowels and resonants." (Robinson 2000:67).

Loans are not necessarily part of the recipient language code. Thus <-chen>, at least in the south, takes no part in the phonologically derived fricative distribution. This certainly is true for Central Bavarian and Standard Austrian German, which will be outlined in more detail later. Moreover, in areas, where <-chen> is native, it is still an Umlaut-triggering suffix. This can be observed in rather new forms, such as <Käffchen> 'small coffee' or <Hallöchen> 'hello', where the stressed vowel is umlauted.

If <-chen> is excluded, why don't we cheer for Jones (1929) and state that indeed we have two separate entities? It seems like Jones was wrong for the right reasons, whereas the structuralists were right for the wrong reasons. Jones argued against the incorporation of meaning into a phonological analysis, but, even in a phonetic conception, his use of phonemes was not any different from Bloomfield's point of view. Bloomfield understood phonemes as entities in a sequence. Even though he recognized phonemes as bundles of

features, he used phonemes as underlying entities. Since *colorless green ideas sleep furiously* (Chomsky 1957), the idea that these bundles of features are the underlying entities, which are interpreted phonetically as sounds of a given language, was internalized by generative grammar.

Now that we have segments consisting of more abstract entities such as features (cf. Jakobson, Fant & Halle 1952, Chomsky & Halle 1968), defined through their ordering in time, the question remains. To reinforce the notion that it is indeed a good idea to ask for the right underlying form, let us consider a model contrary to the "standard view" of segmentation.

Griffen (1977, 1985) proposes an analysis that is not based on segments at all. In his 'dynamic phonology', Griffen extracts the syllable as the basic unit, organized by vocalic patterns. Consonantal obstruction, as an antagonistic force, constrains these vocalic syllables. In this approach the [x] - [ç] distribution is explained due to coarticulation, analogous to the palatalization or velarization, of initial [k] in <Kiel> 'keel' and <Kuh> 'cow', respectively. To account for the <-chen> examples, as in <Kuhchen>, he states that a constraint on the second syllable is realized in case of the suffix, whereas <Kuchen> indicates a constraint on the first syllable. Unfortunately Griffen does not discuss [ç] following sonorants, even though he compares his analysis of the distribution with his analysis of German /r/ quite extensively. We see here that coarticulation alone cannot do the trick, since in the case of his <Kiel>/<Kuh> examples we are dealing with the phonetic phenomenon of vowel transition into the consonant. This phonetic 'process' cannot simply be stopped because phonological constraints say so. We can see in Russian, where palatalized and non-palatalized plosives are distinctive, that vowel transition into the consonant has to be avoided. It is said that Russian /i/ has an [ɨ]-like allophone that surfaces after non-palatal consonants. To maintain a listeners perception of non-palatalized consonants, the following /i/ is reduced, or as Howie (2001) describes: "F2 of /i/ tends to follow a rather sigmoid course following a nonpalatalized

consonant, having only a slight slope at the release of the consonant, then rising fairly steeply, then finally leveling off again toward its target." (Howie 2001:18).

Going back to the hypothesis that it is possible to have underlying /ç/ in Germany and underlying /x/ in Austria, previous arguments favoring one or the other shall be revisited.

3.1.1.2 History

Lüdke (1959) interprets the velar fricative as being underlying, as it is diachronically earlier. He points out that the related languages Dutch and Alemannic preserved the uniform [x]. Therefore the dorsal fricative distribution in German has to be analyzed as palatalization, which explains the correlation of /ʝ/ and /x/. He also mentions that due to a voicing correlation /x/ and /ʝ/ stand alone, each without a partner. Hence there is a tendency of articulatory conditioning, accomplished by palatalization.

Robinson (2000) gives an efficient overview on the diachronic development of [x] and [ç]. There are two sources for the dorsal fricative: */x/ and */k/. The distribution of */x/ was relatively unrestricted in Proto-Germanic, but remained only before a voiceless obstruent and in final position. Medially after a vowel or a resonant it became [h] before it disappeared altogether, which is still displayed in SG orthography. (<saihʋan>-<sehen>, 'see'; <filhan>-<fehlen> 'conceal').[9] Before a vowel, the initial fricative became [h]. (<haurn>-<Horn>, 'horn'). Initially before a resonant, */x/ disappeared during Old High German. (<hlahjan>-<lachen> 'laugh') Note that in West Germanic a consonant gemination occurred before /j/, for which reason the medial [x] remained in <lachen>. It can be observed that vowel syncope occurred before the consonant weakening (<liuhaþ>-<Licht> 'light'). Proto-Germanic */k/ in OHG was subject to the High German Consonant Shift, i.e. it became [k^{x}], which was soon

9 The examples are Gothic - Modern Standard German, if not stated otherwise. The letter <þ> is used for a dental fricative and <hʋ> refers to [x^{w}].

simplified to [x] after long vowels, diphthongs and word-finally, before it was simplified everywhere else later. (<ik>-<ich> 'I'; <taikns>-<Zeichen> 'sign'). */k/ did not shift to [x] word initially or after consonants, including sonorants (Robinson 2000:17-19).

Of course, diachronic development cannot answer the question at hand, but it can be seen as on piece in the puzzle. Other pieces are related phenomena other than <-chen> that either influence the outcome of the dorsal fricative on the surface or work in the same manner. These phenomena are presented in this section chronologically as they appeared in the literature.

3.1.1.3 Umlaut

Lieber (1987), for an autosegmental analysis, also favors the underlying velar fricative. She links the surface [ç] in the suffix <-chen> to her analysis of Umlaut, as <-chen> is an Umlaut-triggering suffix. Examples for Umlaut can be seen in the table (12) below. The stem vowel is umlauted due to a lexical floating [-back] feature. Thereafter the underlying /x/ of the suffix undergoes palatalization. Cases, where <-chen> does not trigger Umlaut, such as <Frauchen> 'woman' (dim.), are problematic.

(12)

	[x]		[ç]	gloss English
Buch	['b̥uːx]	Bücher	['b̥ʏːçɐ]	'book' (sg./pl.)
Koch	['kɔx]	Köchin	['kœçɪn]	'cook' (masc./fem.)
Lachen	['laxən]	lächerlich	['lɛçɐlɪç]	'laugh' (noun/adj.)
Bauch	['b̥aɔx]	Bäuche	['b̥ɔɛçə]	'belly' (sg./pl.)

3.1.1.4 Word-initial [ç]

Ronneberger-Siebold (1988), among others, claims the palatal fricative to be the underlying form because the velar one only appears in the phonological context of back vowels, whereas [ç] is more broadly distributed. Additionally she states that a rule inversion from /x/ → [ç] to /ç/→ [x] took place diachronically, as [ç] is the younger variant, which expanded its distribution at the expense of [x]. She analyzes in the framework of Natural Phonology that deriving [x] after back vowels is a matter of ease of articulation. The fact that this derivation does not apply in morpheme- and word-initial onsets, as well as after underlying /r/, can be explained by clarification, meaning that it is more natural to enhance perception in those contexts. Furthermore she mentions that in Bavarian dialects as well as in a dialect spoken in the Northern Ruhr area, [x] surfaces after vocalized /r/.

When considering the word-initial palatal fricative, it has to be pointed out that word-initial dorsal fricatives are not 'native' in German. Words with written with initial <ch> pronounced as a dorsal fricative are Greek loanwords.[10] According to pronunciation dictionaries words like *Charisma* 'charisma', *Cholesterin* 'cholesterol' or *Chirurg* 'surgeon' have to be pronounced with the palatal fricative [ç]. Additionally a small set of Romance and Slavic loans are considered as pronounced with the velar fricative [x], such as *Junta*, *José* (Spanish) and *Chabarowsk* (Russian). Actual pronunciations vary greatly. The latter examples (with [x]) are often pronounced with initial [h] (Hall 1992) or even [j] (Robinson 2000). The former are pronounced either with [ç], [ʃ] or [k]. Moreover, in the varieties of German, where [ç] tends towards [ʃ], word initial <ch> is pronounced with the palatoalveolar version only if it is followed by a front vowel (13a); [ʃ] preceding back vowels or sonorants is ruled out, as shown in (13b). Note that in BD as well as SAG, all of these cases are pronounced [k].

10 <Chemie> is the one exception, being an Arabic loanword. It is pronounced with [ç] in some parts of Germany.

(13)	a.	Chirurg	['kiʁʊɐ̯g]	['ʃiʁʊɐ̯ç]	'surgeon'
		Chemie	[ke'miː]	[ʃe'miː]	'chemistry'
		China	['kina]	['ʃina]	'China'
	b.	Cholesterin	[kolɛstɛ'ʁiːn]	*[ʃolɛstɛʁiːn]	'cholesterol'
		Charisma	[ka'ʁisma]	*[ʃaʁisma]	'charisma'
		Chlor	['kloɐ̯]	*[ʃloɐ̯]	'chlorine'

Robinson concludes "[...] that one should be very cautious when using loanwords to help justify analyses of standard German." (Robinson 2000:64). He points out that not every borrowing is automatically part of the recipient language code. Therefore, it is undesirable to collapse the deviant behavior of the dorsal fricative word initially with its behavior in non-initial positions into one rule.

3.1.1.5 Spirantization of /g/

In prescriptive SG a syllable-final /g/ spirantizes after [i], except if the following syllable ends in [iç], e.g. the derivational suffix <-lich>, where the outcome is [k], due to additional final devoicing, as shown in (14).

(14)	Köni[ç]	Köni[g]e	köni[k]lich	'king' (sg./pl./adj.)

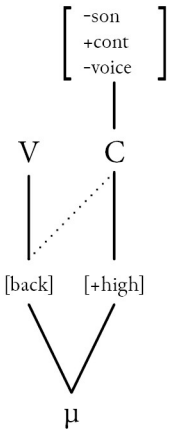
Robinson (2000) points out that we owe this rule to the *German Stage Pronunciation*, i.e. the *Siebs*.

> [...] not only is this exception to the rule of g-Spirantization an unnecessary and arbitrary product of somebody's sense of phonetic aesthetics, the rule of g-Spirantization itself is unnecessarily complicated [...]. And yet we apparently have to capture these artificially-created regularities when we write our grammars of German. (Robinson 2000:3)

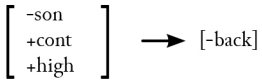
Furthermore in Northern and Central Germany, written <g> also corresponds to [j] medially after front vowels or liquids preceding an unstressed vowel, e.g. <lege>, <läge>, <schweige>, <siege>, <beuge>, <zöge>, <lüge>, <Folge>, <Berge>, etc. (Viëtor 1915: 212).

Hall (1989) proposes an underlying dorsal fricative unspecified for [±back]. Hall's definition of the rule of Fricative Assimilation (henceforth FA), presented in the framework Lexical Phonology, is shown in (15), and (16) presents the additional default rule, assigning the feature [-back] to derive the remaining surface palatal fricatives.

(15) Fricative Assimilation



(16) Default



Note that the feature [-voice] is needed to avoid the application of the rule to the voiced palatal fricative [ʝ], surfacing as the voiced velar fricative [ɣ], in words like ['koːjə], <Koje>, 'bunk'; ['boːjə], <Boje>, 'buoy'; [ka'jyːtə], <Kajüte>, 'cabin'. Hall actually transcribes the voiced palatal fricative as [j] seemingly unaware of the possibility to distinguish the fricative from a [+son] approximant, which would avoid this, admittedly theory driven, problem.

Additionally, the FA rule has to apply after adding <-chen>, since Umlaut feeds FA, but is triggered by certain suffixes. He has to restrict FA to apply to tautomorphemic clusters, to generate the palatal surface fricative in <-chen>. Furthermore Hall argues for an additional

postlexical FA rule, operating on the σ-level instead of μ. It has to be ordered after /g/-spirantization and devoicing, to account for the alternation in ['køːniç] <König> and ['køːnigə] <Könige>, 'king' (sg./pl.). Due to devoicing preceding FA, Hall rules out the surface form ['køːnikliç] <königlich> 'regal'.

The generalized spirantization of syllable-final voiced velar stops in Northern High German is exemplified in (17) (cf. Noske 1990).

(17)	Weg	['veːç]	'way' (sg.)	sag	['zɑx]	'say' (1st sg.)
	beweglich	[bə'veːçlɪç]	'moveable'	sagte	['zɑxtə]	'said' (1st or 3rd sg.)

Noske (1990) agrees with Hall on the notion that Standard German lacks the voiced velar fricative [ɣ] and states further that the *Northern Dialect of Modern Standard German* (Noske 1990) does not have a voiced high fricative either. Therefore she argues for analyzing [j] as a glide rather than the voiced counterpart of [ç], except for the words ['koːjə], <Koje>, 'bunk'; ['boːjə], <Boje>, 'buoy'; and [ka'jyːtə], <Kajüte>, 'cabin'. Contrary to Hall, Noske recalls that Lexical Phonology restricts rules, introducing or changing redundant feature specifications at the postlexical level, as they apply after word-internal morphological boundaries are erased. She claims that it is not necessary to assume that the rules apply cyclically, as neither /g/-spirantization nor devoicing are in need of redundant feature specification and can therefore be seen as postlexical rules. She favors underlying /ç/.

Wiese (1996) adopts Hall's analysis, but adds a rule to derive the uvular fricative. The feature [+low] is introduced if the preceding vowel is [-ATR], as [χ] occurs after [ʊ], [ɔ], [a], and [aː]. He states, similarly to Noske (1990), that Dorsal Fricative Assimilation is a postlexical rule, where prosodic categories are assumed to be available on both levels.

Noske (1997) again argues for an underlying [-back] default in an OT analysis. The constraints CVLINKAGE, requiring double linking of [+back], and the lower ranked IDENT-

IO([BK]), requiring identical [back] values in corresponding segments, cover the fricative assimilation. Additionally the constraint CRISPEDGE(PRWD) is needed to prevent the feature [+back] from spreading over prosodic word boundaries, including <-chen>.

3.1.1.6 [ç] → [ʃ]

There is a debate about an ongoing sound change in the Central German area which shifts the palatal fricative to the palatoalveolar place of articulation and merges it with older [ʃ] (Robinson 2000 and literature therein). Robinson (2000) gives a lexical phonological reanalysis, stating that the velar fricative /x/ is the underlying phoneme. He claims that the palatal fricative is to be treated as a complex segment, associated to the coronal as well as the dorsal node. Hence the palatalization of [x] has to be handled as coronalization, spreading the feature [coronal]. Admittedly /r/ and /l/ have to be seen as containing a [coronal] feature. Robinson actually uses the feature [high], as the affected consonants are articulated with a raised tongue-body. Thus the process Dorsal Fricative Assimilation can be renamed High Fricative Harmony. Additionally "[...] the change of [ç] to [š] in German colloquials should in some way or another be describable as a simplification." (Robinson 2000:99). Deriving [ʃ] from [ç] by simply delinking the dorsal note fits in nicely.

Robinson (2000) also reformulated his analysis into the constraint based framework Optimality Theory. The constraint HIGH FRICATIVE HARMONY (HFH) then is to be read as "[+high] fricatives must be associated with the articulatory node of the preceding [coronal] nonobstruent, and /l/, /n/ and /r/ (in this position a non-back, i.e. coronal, vowel) are included as preceding environments for [ç]." (Robinson 2000:133). This constraint is ranked highest. To account for the change of [ç] to [ʃ], Robinson proposes the constraint *ARTICULATOR NODE BRANCHING (*ANB), which says that "a segment linked to the coronal

node may not also be linked to the dorsal node." (Robinson 2000:134).[11] In the varieties that do not change [ç] to [ʃ], *ANB has to be ranked after a C-FAITH subconstraint, specified for [coronal]. The constraint ranking "HFH >> C-FAITH >> *ANB," however, needs the input [ç] for <-chen> and word-initially to generate the right output.

3.1.2 Summary

We have seen in this section that whenever a piece of data pointed towards underlying /ç/, a closer look revealed that the data might not be as reliable as it seemed. The surface pronunciation [ç] of word-initial <ch> as well as the diminutive suffix <-chen> is a matter of lexical marking, rather than an indication of underlying /ç/. Tradition rather than faithfulness to the data led to a "boundary problem". Furthermore the change of [ç] towards [ʃ]/[ɕ] indicates underlying /x/, with additional fronting of [ç], since deriving either [x] or [ʃ] from underlying /ç/ is a very unlikely scenario. Additional evidence for that can be found in the fact that word-initial <ch> is pronounced [ʃ] iff it is followed by a front vowel. The initial working hypothesis, having different underlying forms in different varieties, could be reformulated in favor of an underspecified underlying form. This however seems to be a highly theory-driven approach. The data still turns us towards underlying /x/. Below it will be shown that the situation in Austria is even clearer on that point.

11 Robinson is aware of the fact that *ANB needs further specification, otherwise it would affect other complex segments as well, such as labiovelar consonants or front rounded vowels.

3.1.3 The Dorsal Fricatives in Austria

In Austria the dorsal fricatives differ in distribution.[12] The main focus lies on Central Bavarian dialects, as the Alemannic area and parts of the Southern Bavarian dialect region lack [ç] and the dorsal fricative distribution altogether. As far as I am aware, the Central Southern Bavarian transition zone has not yet been described with respect to the matter in question here. Input-switch rules interfere with the outcome of the fricative, as the vowels change. For example, the word <Licht> 'light' surfaces as [lɪçt] in SG, but [liaxd̥] in BD. The ISR concerning MHG long [ī], outlined above, generates divergences like <weich> 'soft', surfacing as [waɛç] in SG, but [waːx] in VD, and [wɔax] in other BD. Preserved forms of Proto-Germanic */x/ in medial position, lead to forms like [d̥seçŋ] <Zehe> 'toe', or in combination with an ISR even [siaxsd̥] 'see' (2nd person sg.), which corresponds to SG [ziːst] <siehst>. Moreover medial [x] and [ç] might dissimilate to form [siagsd̥]; [hɛg̊sd̥ns] <höchstens> 'tops', or [mɔ̃ng̊smɔɛ], which corresponds to SG <manchmal>, respectively <manches mal> 'sometimes'. Even though SG <manch> [manç] is used by BD speakers, it seems to be a loan from literary German as well. Speakers even pronounce [mɔ̃xɛ] <manche> 'many a', due to an additional process of nasal deletion, which usually effects word-final nasals.

To stress what was outlined earlier in this section: <-chen> is not a native suffix in the south of the German speech community, including Austria and Southern Germany. Thus variation is expected and found in the KOeD, where speakers of a CBD produce forms like [kind̥ɐxɛn] <Kinderchen> 'little children', which was formed spontaneously, or even [mɛɐxɛn] <Märchen> 'fairy tale', which, in Robinson's terms, would be a lexically stored form. These speakers, of course, did not generally pronounce <-chen> with [x], but observing this variation indicates that Robinson's statement concerning <-chen> was accurate.

12 Unless otherwise specified, the data described here was taken from the 'Corpus of Austrian German' (Korpus Österreichisches Deutsch, henceforth KOeD), provided by the Acoustics Research Institute in Vienna (www.kfs.oeaw.ac.at).

Additionally after vocalized /r/, [x] is used. One quite recent written reference comes from Clyne, when he states that "[x] [occurs] after [r] and some front vowels [sic!]" (Clyne 1992:126). More than one problem arises with this statement. Firstly, [r] in square brackets indicates the usage of the alveolar trill in Austria. Secondly there is no allusion to /r/-vocalization, spawning a low central offglide [ɐ], which, in Austria, leads to [x]. Unfortunately he has nothing more to say about 'some front vowels'. Based on his IPA transliterations, one could guess that he might refer to words like <Kirche> 'church', where a front vowel precedes the vocalized /r/, as the SG output in such cases is [ç]. On the other hand, if he is aware of /r/-vocalization spawning an [a]-like sound, this might be related to the analysis of [a] as a front vowel. This view is not uncommon, but problematic nonetheless. The traditional IPA vowel chart refers to reference points for tongue position and [a] requires the tongue body to be slightly more fronted, but both vowels, [a] and [ɑ], require stricture in the pharynx. Thus both are back vowels. The higher F2 in [a] is caused by the pharyngeal stricture being closer to the glottis. Apart from that, /a/-vowels not resulting from /r/-vocalization spawn the surface fricative [x].

Luick (1932) already noted that 'we' in Austria have a uvular fricative, contrary the notion of pronouncing the palatal [ç] after /r/, /l/ and /n/.

> nach r, l, n wie in *Kirche, Storch, Kelch, manch* immer palatal, während wir nach r gutturalen Laut haben. (Luick 1932:98)

This is an addendum, as the first Edition of his book "Deutsche Lautlehre: mit besonderer Berücksichtigung der Sprechweise Wiens und der Österreichischen Alpenländer" ('German Pronunciation: with particular consideration of speech in Vienna and the Austrian Alpine States') published in 1904, does not contain this. The paragraph which both have in common says that <ch> should have either a velar or palatal articulation. Tyroleans have to be especially careful, as they are accustomed to articulate “velar X” in every context.

> Ferner ist ch nach Maßgabe des vorausgehenden Vokales entweder velar oder

> palatal zu sprechen [...], worauf Tiroler zu achten haben, welche in allen Stellungen velares X zu artikulieren gewohnt sind. (Luick 1904:96)

Phenomena related to the dorsal fricative in BD also have to be addressed. In fact, Clyne shows that "statistic variation occurs between stylistic [Ik] and [Ic] in words spelled -ig, e.g., [ruIk] ruhig in informal Austrian Standard Register." (Clyne 1992:126). This has to be handled carefully. It was already stated that /g/-spirantization before /i/ is an artifact of a *Siebsian* pronunciation rule, which is still partially observable on Austrian stages.[13] Additionally, this variation, or even confusion, is most pressing in Vienna, as this very spirantization of the velar lenis plosive after /i/ is a dialectal marker in VD. Forms like ['ʀuːɪç] <ruhig> 'quiet' might not only be found in VD, but in other CBD as well. In VD however, this spirantization is not restricted to word-final positions, but also occurs before additional suffixes, as <-keit>, e.g. ['ɔɐ̯baɛd̥slosiç‚kaɛd̥] <Arbeitslosigkeit>, 'unemployment' and in numerals, especially when they are emphasized. Numerals are either pronounced with /i/ followed by a palatal fricative, or a velar lenis plosive and no /i/, e.g. ['d̥svand̥siç] or ['d̥svɑnd̥sg̥]/['d̥svɔand̥sg̥] <zwanzig>,'twenty'. Hence it comes as no surprise that statistical variation occurs. Here the "sandwich position" of SAG can be observed, since SG as well as VD spirantize /g/ after /i/, indicating that SAG speakers most likely choose to avoid spirantization in this case. Furthermore, in VD, inflected forms of <-ig> are pronounced with the palatal fricative as well, indicating the possibility of an underlying /x/. This clearly is an issue worthy of further research.

Kleiner (2010) gave an empirical overview on the pronunciation of <-ig> in German standards. Unfortunately, the interpretation of the corpus he used is problematic for Austria, as high school students were interviewed, but it cannot be assumed automatically that high school students speak SAG in every area of Austria. Furthermore, he believes that the interviewees suspected that the fricative is less formal, contrary to the postulations in

13 The Viennese *Burgtheater* for example has the policy that their actors and actresses may choose to pronounce either the plosive or the fricative as long as their usage is consistent.

pronunciation dictionaries. He found interesting variation in Linz, the capital of Upper Austria, where the plosive was used in <einig> 'agreed', but nearly exclusive usage of the palatal fricative was observed in <richtig> 'right'. In Vienna, on the other hand, the distribution of /g/ and [ç] was equally balanced in these two words. Throughout Austria fricative pronunciation in the word <einig> was found only in Vienna. A more frequent fricative usage in <richtig>, contrary to <einig>, was observed across the German speech community. This might indicate that some confusion concerning the 'proper standard pronunciation' of <-ig> is not restricted to Austria.

Another, loosely related, phenomenon is Isochrony (Kühnhammer 2004, and literature therein). In BD plosives do not have a voicing distinction, but differ in length, i.e. have a fortis/lenis distinction.[14] This leads to minimal pairs like ['koːb̥ɣ̊] <Kopf> 'head' vs. ['kepf] <Köpfe> 'head (pl)', ['oːɣm̥] <Ofen> 'oven' vs. ['ofm̥] <offen> 'open' and ['oːb̥ɐ] <Ober> 'waiter' vs. ['opɐ] <Oper> 'opera'. This complementary lengthening affects fricatives too and leads to the four-way distinction of the dorsal fricatives shown in (18).

(18)	['b̥ɔːɣ̊]	<Bach>	'rivulet'	['b̥eːi̯̊]	<Pech>	'bad luck'
	['b̥axɐl]	<Bacherl>	'rivulet' (dim.)	['b̥ɛç]	<Bäche>	'rivulet' (pl.)

Moosmüller (2007) looked at the phonetic correlates of isochrony and vowel duration in Viennese Dialect. She discovered that 5 out of 6 speakers maintained isochrony, but a neutralization of the fortis/lenis opposition can be observed. In the word <Straße> ['ʃd̥rɔːsn̥] 'street', supposedly V:L, from OHG strâza, a longer duration of the obstruent was measured, compared to other lenes, but this does not make the obstruent a fortis either. She concludes

14 Fortis and lenis are understood here as cover-terms for different opposition-strategies, such as voicing in Italian, or aspiration in English and Standard German. A Government Phonology analysis of Central Bavarian isochrony indicates a simplex/geminate opposition (Kühnhammer 2004).

later that in the interaction of dialect and standard in Austria, the absolute vowel duration complies with SG, whereas the timing of SAG has a Bavarian foundation.

3.1.4 Summary

In Austria the distribution of [ç] and [x] differs. Alemannic preserved the use of [x], with no palatal allophone. In CBD [x] is more common than [ç], since input switches reduce the fronting environments, <-chen> is borrowed from literary German, word-initial <ch> is pronounced [k] and, of course, [x] is used after vocalized /r/. Only /g/-spirantization after /i/ provides an additional [ç]-friendly context. Additionally, the described lack of [ɣ] for SG and Northern German colloquials cannot be observed in BD due to Isochrony. CBD influence SAG rather heavily. Thus it can be argued that SAG maintains [x] after vocalized /r/, as [x] is the more common. After /r/ is discussed, we will see whether that argument has any grounding. Beforehand, let us consult Robinson (2000) once more for a brief summary. He concludes that i) [k] is the the most unmarked of the three consonants [k], [ç] and [x], ii) [ç] before front vowels is less marked than [x] before back vowels, shown by the stronger tendency of the latter to merge with [k], iii) [ç] is less stable before back vowels, as it also tends to be replaced by [k] and iv) in the process of "Eindeutschung", [ç] before front vowels tend to become [k] or [š] (Robinson 2000:63).

3.2 /r/

Previously it was shown that the different surface forms of the dorsal fricatives after /r/-vocalization cannot be explained with different underlying forms in different varieties. Therefore, the difference has to lie elsewhere. One possibility would be to assume different underlying /r/-phonemes. Another possibility might lie in the vocalization of /r/, where speakers of Standard German and/or its related dialects reconstruct underlying /r/, whilst speakers of SAG or BD have [ɐ] underlyingly. These possibilities will be explored in this section. /r/ and /r/-vocalization will be described first for Germany, then for Austria, after /r/ is explored in a more general manner.

Rhotics come in great variation. The range in place of articulation varies from dental to uvular, or even bilabial, if the voiced bilabial trill [B] is a member of the group. Manner of articulation is equally colorful, given that /r/-sounds can be approximants, trills, fricatives, taps and flaps with vocalic equivalents. In Table (19) all possible consonantal realizations of /r/ mentioned by Wiese (2001, 2003), Lindau (1985), Ladefoged & Maddieson (1996) and Ulbrich & Ulbrich (2007) are summarized.

(19)

	bilabial	dental /alveolar/ post-alveolar			retroflex	velar	uvular
trill	ʙ	r	r̪	(r̺)			ʀ
tap/ flap			ɾ		ɽ		ʀ̆
lateral flap			ɺ				
fricative			ɾ̞			x ɣ	χ ʁ
approximant			ɹ		ɻ		ʁ̞

There is some inconsistency in the IPA conventions, whether the symbol [ʁ] is used as a fricative or an approximant. Here the diacritic for lowering [˕] is used to indicate the approximant character, but it would be as well possible to use an additional [˔] for the fricative, as was done for [r̝], which is mentioned twice, as the Czech consonant written as /ř/ is often described as 'partially a fricative'. One might find the velar fricatives odd to be mentioned in this table, but they are possible realizations of /r/ in coda positions in German varieties, as well as their uvular fellow, where usually just the voiced variant is mentioned as a member of the rhotics group. Furthermore Ulbrich & Ulbrich (2007) identified a uvular tap as a possible but rare realization of /r/ in German varieties. IPA offers another diacritic [˞] to be added to vowels indicating rhoticity. Moreover /r/-sounds differ in length, aspiration and might even be nasalized. (Wiese 2001, Lindau 1985) Some of the rhotics have the acoustic similarity of lowering the third formant, but even this is not true for every member of the class of /r/-sounds. Lindau (1985) discovered that a lowered 3rd formant, which works well for classifying /r/-sounds in American English, is rather unusual in the languages of the world. Wiese (2001) reflects that a lowering of the 3rd formant might be reason why rhotacized vowels are called rhotacized vowels.

Lindau (1985) gave a pointed summary of these observations when she wrote: “[...] there is no physical property that constitutes the essence of all rhotics.” (Lindau 1985:166). Ladefoged & Maddieson (1996) note that “[...] the term rhotic and r-sound are largely based on the fact that these sounds tend to be written with a particular character in orthographic systems derived from the Greco-Roman tradition, namely the letter 'r' or its Greek counterpart rho.” (Ladefoged & Maddieson, 1996:215). Wiese describes this as a paradox, as there has to be some unity that justifies the usage of terms like /r/-sounds or rhotics, beyond diachronic developments and orthographic consistency. He concludes that “[g]iven present knowledge and the state of the art, it is clear that the unity of rhotics can only be found in their phonological behavior.” (Wiese 2001:341).

Another paradox is the contrast of comparing the large group of available /r/-sounds with the fact that languages prefer to have only one /r/-phoneme and there is no language that has more than four distinct /r/-phonemes.[15] Moreover languages with one /r/-phoneme tend to allow a large set of possible realizations, which is one additional reason why it is hard to capture the full range of /r/-sounds.

3.2.1 /r/ in Germany and Austria

German is one of the many languages of the world with exactly one /r/-phoneme that can have almost any variant in contextual and dialectal variation. A recent sound change took place in German from an alveolar trill [r] to a uvular approximant [ʁ̞]. This is "arguably the only sound change that German speakers are aware of within their own life-time exposure to their language [...]" (Wiese 2003:28).

Similar changes are described for Austria, with the differences that firstly the uvular realization is mainly identified as trilled [ʀ] and secondly the alveolar one is still found in dialectal variation, primarily in Alemannic[16] and Southern Bavarian varieties, as well as in the context of preceding alveolar plosives. Note that in the codification norm *Siebs* only the alveolar trill [r] was permitted. Let us now turn to a major part of this thesis, namely the so called vocalized realization of /r/.

3.2.2 /r/-vocalization

/r/-vocalization is often described as /r/ having a vocalic allophone, transcribed e.g. as [ʌ] (Hall 1993), or [ɐ] (Wiese 1996, among others). In a traditional rule-based analysis,

15 Wiese points out that in the literature of Gaelic, the only language listed to have four distinct /r/-phonemes, this point of view is rather controversial.

16 Ulbrich & Ulbrich (2007) found a similar effect in Swiss German.

/r/-vocalization is analyzed as being the product of two different phonological processes, one being schwa epenthesis (20a) and the other one /r/-deletion, as seen in (20b) (cf. Kohler 1990, Rennison 1981, Dressler & Wodak 1982).

(20)	a.	Ø → ɐ / V _ r	(a low offglide appears in the context between a vowel and /r/)
	b.	r → Ø / V _ {C, #}	(/r/ is deleted in the context of a preceding vowel and a following consonant or word boundary)

3.2.2.1 /r/-vocalization in Germany

In SG the vowel [ɐ], which arises from /r/-vocalization, "is monosegmental and stands in phonemic contrast to schwa, as demonstrated by pairs such as Lehr[ə] vs. Lehr[ɐ], Kutt[ə] vs. Kutt[ɐ]." (Wiese 1996:252). Wiese (1996) supports the systematic correspondence between /r/ and [ɐ] by giving the examples shown in (21). He distinguishes syllabic [ɐ], shown in (21a) and non-syllabic [e̯], exemplified in (21b).

(21)	a.	[gʀøː.sɐ]	<größer>	[gʀøː.sə.ʀə]	<größere>	'big' (comparative isolated/ inflected)
		[laɪ.tɐ]	<Leiter>	[laɪ.tə.ʀɪn]	<Leiterin>	'manager' (masc./fem.)
		[ʀuː.dɐ]	<Ruder>	[ʀuː.də.ʀɐ]	<Ruderer>	'oar' (instrumental/agent)
	b.	[tyːe̯]	<Tür>	[tyː.ʀən]	<Türen>	'door' (sg./pl.)
		[ʃveːe̯]	<schwer>	[ʃveːʀe̯]	<schwerer>	'heavy' (pos./comp.)
		[fɛːe̯t]	<fährt>	[faː.ʀən]	<fahren>	'drive' (3rd pers. sg./pl.)

According to Hall (1993) /r/-vocalization in SG is optional in the coda after a short vowel, where the pronunciation as /r/ is typical for formal, careful speech, whereas the vocalized version indicates fast and casual styles (Hall, 1993: 88). This is shown in (22) below. Wiese (1996) states that "vocalic [ɐ] predominates after long vowels (as in Heer [heːɐ]) and in the prefixes *er-, her-, ver-,* and *zer-* (where it is less clear whether the vowel is long.)" (Wiese 1996:253).

(22)	Herr	[hɛʀ]	[hɛɐ]	'Mister'
	irrt	[ɪʀt]	[ɪɐt]	'to err' (3rd pers. sg.)
	Berlin	[bɛʀliːn]	[bɛɐliːn]	'Berlin'

3.2.2.2 /r/-vocalization in Austria

The vocalization of /r/ in coda position to a low offglide [ɐ] is a fully generalized process in the Central Bavarian part of Austria and it is spreading further south (Moosmüller 1991:79). The process is considered generalized in SAG too. Hence it is not identified as a dialect marker.

(23)	MBD		SAG		gloss German	gloss English
	['d̥iːɐ]	['d̥iːɐʁɛ][17]	[tiːɐ]	['tiːɐʁɛ]	Tier - Tiere	animal (sg./pl.)
	['uːɐ]	['uːɐn]	[uːɐ]	['uːɐʁɛn]	Uhr - Uhren	clock (sg./pl.)

Additionally, as mentioned earlier, the SG [ə] is not used in SAG, where the most formal variant of the verbal inflectional suffix <-en>, for example, is [ɛn], not [ən]. The corresponding SG plural forms in (23) would be [tiːɐʁə] and [uːɐʁən]. In CBD the usage of

17 This is not an ideal dialect example as the true dialect word [fiːç] <Vieh> differs lexically.

[ɐ] also includes contexts unrelated to /r/-vocalization. One example is the just mentioned suffix <-en>, being realized as [ɐn] when it is attached to a nasal-final verb stem (Rennison, et al. 2010). The broader usage of [ɐ] in CBD points towards the possibility of underlying /a/ instead of /r/, as hypothesized earlier.

Note that /r/ resurfaces in intervocalic position. Therefore [uːɐn] doesn't have a consonantal /r/ realization. Additionally, every resurfacing /r/ is preceded by [ɐ]. The only context where the /r/ does not produce a preceding offglide is before suffixation, when it is preceded by a consonant or a diphthong. The SAG pronunciation is exemplified with the two derivation suffixes <-ig> and <-isch> in (24).

(24)	C_	fiebrig	['fiːbʁɪg]	'shivery'
		widrig	['wiːdʁɪg]	'contrarious'
		eifrig	['aɛfʁɪg]	'avid'
	VV_	feurig	['fɔiɪʁɪg]	'fiery'
		bairisch	['baɛʁɪʃ]	'bavarian'
		schaurig	['ʃaɔ̃iʁɪg]	'eerie'
	V(ː)_	gierig	['giːᵊʁɪg]	'greedy'
		-spurig	['ʃbuːᵊʁɪg]	'-tracked'
		euphorisch	[ɔɪ'foᵊʁiʃ]	'euphoric'

In Viennese Dialect the diphthongs [aɛ] and [aɔ] underwent monophthongization and became [æː] and [ɒː] (Vollmann & Moosmüller 2000). Interestingly, these monophthongs prevent the [ɐ] from surfacing before remaining /r/, just as the diphthongs shown in (24). This phenomenon nullifies the hypothesis of underlying /a/ in CBD. Before, one might have been tempted to argue for a reanalysis of morpheme-boundaries, such as plural [-ʁɛ] instead

of [-ɛ]. Therefore, the only remaining possibility is to argue for different underlying /r/s. This will be outlined shortly.

But before that, two related phenomena that occur in Viennese Dialect have to be mentioned. The first one is optional intrusive /r/ in external sandhi positions, shown in (25) and the second is an anaptyxe triggering prosodic resyllabification used for a mockingly hyperbolic speech style. This is shown in (26).

(25)	[dɔ gɛː iː]	[dɔ gɛː ɾ iː]	da gehe ich	'here I walk'
	[wɪɐ aː]	[wɪɐ ɾ aː]	wie er	'as he'
	[duɐ iː]	[duɐ ɾ iː]	tue ich	'I do'

(26)	[faʃvɪnd]	[faʃɐvɪnd]	verschwinde	'shove off'
	[gʁɔdɒːz]	[gɐʁɔdɒːz]	gerade aus	'strait ahead'
	[ʃnapsɐl]	[ʃɐnapsɐl]	Schnäpschen	'schnapps' (dim.)

3.2.3 Discussion

What can be learned from this? We have seen that a difference in the vocalization of /r/ is unlikely. Claiming different underlying /r/s, on the other hand, might not be as implausible. It was shown that /r/-sounds come in quite some variation and having more than one /r/-phoneme is possible. The strongest claim to support this assumption lies in first language acquisition.

First language acquisition is an abductive process (Roberts & Dixon 2007, among others), i.e. children learn their native language(s) through trial and error. Since /r/ comes in such great variation, children might need to turn to phonological processes in order to construct their underlying representation of /r/. In fact, the idea that the phonological basis, or

underlying form, is built by their function in context, is not new (cf. Waterson 1971). Therefore the initial question has to be answered in reverse. SG /r/ is perceived as a palatalizing environment because of surface [ç]. Furthermore, because SG speakers tend to articulate their <ch> even more fronted, towards the location of the palatoalveolar constriction, and because [ç] is more broadly distributed, surface [ç] holds even after /r/ is vocalized to an /a/-like offglide.

4 Government Phonology

> [Government Phonology] makes a dramatic break with the classical generative approaches in that it replaces the rule component with a group of universal principles common to all linguistic systems along with a series of parameters delimiting the nature of linguistic variation from one system to another. (Cyran 1997)

Government Phonology (GP) is a principles and parameters theory of phonology. It is a representational theory with a high degree of abstraction and the aim of providing a formalism that is as strict and minimal as possible. GP countermands arbitrariness between phonological events and the context in which they occur. Originally, the phonological structure was defined in terms of the constituents *onset*, *nucleus* and *rhyme*. Relations between these constituents were strictly local and strictly directional, allowing for maximally binary branching constituents. (Kaye, Lowenstamm & Vergnaud (henceforth KLV) 1985, 1990, Kaye 1990, Charette & Kaye 1990, Charette 1991, Cyran 1997). Here, two modifications of GP are will be used: strict CVCV and VC Phonology, both of which assume only non-branching pairs of onsets and nuclei as the minimal phonological structure. Before going into detail, GP's theory of melody is outlined. In the theory of melody, distinctive feature theory was criticized for overgenerating the number of possible phonological objects and the melodic primes were reduced drastically, making use of univalent, privative elements. The question concerning the number of elements is an ongoing one. (Harris 1994, Harris & Lindsey 1995, Kaye 2000, Scheer 2004, Pöchtrager 2006, Backley 2011). The analysis provided here basically uses the theory described in Backley's recent introduction (Backley 2011).

4.1 Element Theory

In a nutshell, underlying forms are not encapsulated objects such as phonemes, but a small set of abstract, universal cognitive entities called elements, which are privative, i.e. either present or absent from a melodic expression (ME). They may be interpreted directly or in combination with other elements (in complex melodic expressions). The elements are "mental categories that carry linguistic information about segments and morphemes, but for communication purposes they also connect to the physical world by mapping onto information bearing patterns in the speech signal." (Backley 2011:15).

Element Theory (henceforth ET) is a generative theory of phonology that does not include any articulatory phonetic information in phonological representation, but acknowledges certain basic acoustic properties. Each element is said to have a unique acoustic signature (cf. Harris & Lindsay 1995). These are also needed, or at least useful, for the identification of the basic phonological units in a specific language by its toddlers acquiring their first language.[18] The set of elements used here is quite common: {I,U,A,H,L,?} (Backley 2011, Kaye 2000).

Set of elements: {I,U,A,H,L,?}

4.1.1 Vowels

The basic elements for vowels are |I| |U| and |A|. As a simplex vowel expression they are interpreted as [i], [u] and [a]. These basic vowels occupy the edges of the acoustic vowel space and have very stable and distinctive phonetic qualities.

18 For an interpretation in sign language cf. Fischer & van der Hulst (2003).

Translated into classical feature theory, one might think of elements as bundles of features, where one feature captures the gist of the element in question, as ET was explained in its early stages. Here, the matrices of the three vowels, represented by a single element, are shown in (27). Irrelevant features were excluded. The 'hot' feature is underlined (KLV 1985:306).

(27)

$$I = \begin{bmatrix} -\text{round} \\ \underline{-\text{back}} \\ +\text{high} \\ -\text{low} \end{bmatrix} \quad U = \begin{bmatrix} \underline{+\text{round}} \\ +\text{back} \\ +\text{high} \\ -\text{low} \end{bmatrix} \quad A = \begin{bmatrix} -\text{round} \\ +\text{back} \\ \underline{-\text{high}} \\ +\text{low} \end{bmatrix}$$

Feature systems cannot capture the essence of what these three vowels have in common, viz. the fact that they form a natural grouping, marking the extreme points of the vowel space, i.e. being maximally acoustically distinctive. By combining the three vowel elements, more complex vowel inventories can be captured. A five vowel system is displayed in (28).

(28)

	i	|I|			|U|	u
		e	|I A|	|U A|	o	
				|A|		
				a			

However, this combination of elements is not symmetrical, but ordered by headedness (KLV 1985, Harris & Lindsey 1995). An element may reside in the head position and thus license its (set of) operator(s). Headless MEs are possible in some languages. Licensing constraints restrict certain combinations of elements. For example, the licensing constraint *I and U may not combine* excludes front rounded vowels from the vowel inventory of a given language (Kaye 2000).

Let us explore the Standard German vowel system, which it is more comprehensive than that. Wiese (1996:153) gave an analysis of a radically underspecified vowel system in distinctive feature theory, as shown in (29).

(29)

	iː	ɪ	eː	ɛː	ɛ	aː	a	oː	ɔ	uː	ʊ	yː	ʏ	øː	œ	ə
high	+	+								+	+	+	+			
front	+	+	+	+	+							+	+	+	+	
round								+	+	+	+	+	+	+	+	
ATR				-												
long	+		+	+		+		+		+		+		+		

This chart can easily be translated into ET. First is has to be said that the last two rows ([long] and [ATR]) are displayed here for the sake of completeness, as in GP length is a structural matter and degree of constriction, which is what Wiese refers to when he writes ATR, is displayed through headedness.[19] It has to be pointed out that Wiese cannot make a distinction between [a] and [ə], as he chose [high] instead of [low] for his feature geometry, to be able to do Umlaut. Thus he manages the distinction with an empty X-slot in case of [ə] vs. a lexically underlying vowel in case of [a]. But why would the output be any different just because the nothingness is an underlying one? In GP, schwa is the realization of an empty X-slot as well, but a full vowel has to contain melody.[20]

In addition the observation can be made that the degree of constriction (here ATR, in other feature theories also labeled [tense/lax] or even [±constricted]) correlates with vowel duration, except for [ɛː]. Wiese notes that the distinction between [eː] and [ɛː] is very likely to be neutralized. Henceforth, Wiese's short vowel [a], will be displayed as [ɐ].

As for the other features displayed in (29), it can be said that all round vowels contain |U|, the front vowels contain |I| and the non-high vowels contain |A|. Therefore in ET we have the representations of the vowel inventory shown in (30).

19 Real ATR and ATR-harmony, which is not the same as a tense/lax distinction in European languages, can not be captured by headedness, but through element spreading. For phonetic insights cf. Ladefoged & Maddieson (1996), Edmondson & Esling (2006).

20 But see Pöchtrager (2006), who claims that an |A| element is actually the manifestation of additional structure.

(30)	i	ɪ	e	ɛ	a	ɐ	o	ɔ
	|I̲|	|I|	|A.I̲|	|A.I|	|A̲|	|A|	|A.U̲|	|A.U|
	u	ʊ	y	ʏ	ø	œ	ə	
	|U̲|	|U|	|U.I̲|	|U.I|	|A.U.I̲|	|A.U.I|			

As outlined earlier, the standard based on Central Bavarian dialects has the broadest acceptance range throughout Austria. Therefore further analyses rest upon these varieties. Kühnhammer (2004) gave an inventory of lexical vowels for CBD, which is given in (31).

(31)	i			u	ia		ua
	e		o				
		ɛ	ɔ				
		a			ɛa	aɛ	aɔ[21]	ɔa

According to Kühnhammer (2004) lexical diphthongs are [ia], [ɛa], [aɛ], [aɔ], [ɔa] and [ua]. The diphthongs [ia] and [ua] correspond to SAG /i/ and /u/. In VD [aɛ] and [aɔ] underwent monophthongization and became [æː] and [ɒː].[22] Central Bavarian [ɔa] corresponds to SAG /ei/, which, again corresponds to Viennese [ɑː], due to the diverse diachronic development from MHG /ei/ (cf. Schikola, 1954). The diphthong [ɛa] is found in forms like ['ɣɛan]<Wien>, 'Vienna' or ['g̊ʁɛã], <grün>, 'green'. These forms are rare in VD as well. A list of ISRs is given in (32). The SAG vowels are listed in comparison to the vowels of VD according to their corresponding MHG ancestors. It can be seen that correspondences are directional in the sense that, for example, SAG /i/ corresponds to VD /ia/ or /iː/, whereas VD /ia/ corresponds to SAG /i/ and occationally /y/.

21 Kühnhammer originally transliterated the diphthongs [aɛ] and [aɔ] as [ae] and [ao].

22 Viennese monophthongization extends to other CBD (cf. Moosmüller & Scheutz, in press).

(32)	MHG	SAG	VD	Example	Gloss
	ie	/i/	/iɐ/	lieb	dear
	i	/i/	/iː/	Wiese	meadow
	i	/ɪ/	/iː/	Fisch	fish
	üe	/y/	/iɐ/	grüßen	to greet
	u	/ʏ/	/i/	Hütte	hut
	eː	/e/	/e/	beten	to pray
	ɛ	/ɛ/	/e/	Bett	bed
	e	/ɛ/	/eː/	Äpfel	apples
	œ	/ø/	/ɛː/	böse	bad
	ø	/œ/	/eː/	könnte	could
	uo	/u/	/uɐ/	Schuh	shoe
	u	/ʊ/	/uː/	Kutteln	tripe
	oː	/o/	/oː/	Rose	rose
	o	/ɔ/	/o/	Gott	god
	iː	/aɛ/	/æː/	Wein	vine
	ou	/ɑɔ/	/ɒː/	Staub	dust
	ei	/aɛ/	/ɑː/	Laib	loaf
	ou	/ɑɔ/	/ɑː/	Baum	tree
	a	/ɑ/	/ɔ/, /ɔː/	Bad, Wasser	Bath, water

Kühnhammer (2004) points out that additional vowel combinations are products of several vocalization processes. The combinations [oi], [ɔɛ], [ui], [æ], [y], [ø] and [œ] are products of /l/-vocalization, where /l/ either surfaces as /i/, or not at all, but induces rounding in preceding vowels and surface forms like [goiḍ̥] <Gold> 'gold', [ḍ̥ɔːɛ] <Tal> 'valley', [ʒ̥uːi] <Schule> 'school', [ɣ̥æːn] <faulen> 'to stink/ rot', [ɣ̥yː] <viel> 'much', [œtɐn] <Eltern> 'parents' and [ʒ̥nœː] <schnell> 'fast' (Kühnhammer 2004).[23] Additionally, the monophthongs

23 The notion of counting /l/-vocalization as a syncronically productive process is controversial, but I will go with Kühnhammer on this for the time being.

[æː] and [ɒː] are needed for VD. Further, the default schwa [ɐ] is added to display the interpretation of melodically empty constituents. Therefore, a CBD inventory is given in (33). Again, [æː] and [ɒː] are not part of every CBD.

(33)	i	e	ɛ	a/ɑ	ɐ	o	ɔ	u	æ	ɒ
	|I|	|A.I|	|A.I|	|A|	| |	|A.U|	|A.U|	|U|	|I.A|	|U.A|

Note that in VD, the distinction between [e] and [ɛ] is not made systematically. Kranzmayer (1953) called this *e-confusion* ("e-Verwirrung"), as he believed that due to monophthongization, resulting in an enriched vowel inventory, a chain shift happened, causing the /e/-vowels to neutralize. However, these changes happened independently (Moosmüller & Scheutz, in press). Therefore the term *confusion* is not accurate. Again, the change from MHG /ei/ to [ɑː] in VD, corresponds to [ɔɑ] in other CBD.

Moosmüller (2007a) identified thirteen vowels for SAG, where tendencies towards neutralization were found in the high vowel pairs i-ɪ, y-ʏ and u-ʊ (Brandstätter 2013, Brandstätter & Moosmüller to appear). The SAG vowel inventory is given in (34). Note that the same ME may spawn different phonetic interpretations in CBD and SAG. Again, the list of ISRs, given in (32) may help to comprehend the interaction.

(34)	i	ɪ	y	ʏ	u	ʊ	e
	|I|	|I|	|U.I|	|U.I|	|U|	|U|	|A.I|
	ɛ	ø	œ	o	ɔ	ɑ	ɐ
	|A.I|	|A.U.I|	|A.U.I|	|A.U|	|A.U|	|A|	| |

4.1.2 Consonants

As mentioned earlier in this section, the full set of elements used by Backley is {I,U,A,H,L,ʔ}. In consonants, the elements |I|, |U| and |A| are used as place definers and |H| |L| and |ʔ| are the manner elements. Additionally, the manner elements are used in vowels for laryngealized and nasalized vowels as well as tone. Elements are independently interpretable and structural constituents determine their interpretation. Every element can be linked to a structural onset or nucleus position. As an example, an |I| element, linked to an onset position, may be interpreted as [j]. As said earlier, whether the element occupies a head or operator position influences their interpretation as well. In table (35) Backley's view on elements in consonants is summarized, with an additional row displaying the role of 'consonant elements' in vowels.

(35)	Head	Operator	(Vowel)
I	palatal	coronal (dental or alveolar)[24]	
U	labial	velar	
A	pharyngeal or coronal (retroflex)	coronal (dental or alveolar)	
L	voice	nasal	nasalized, low tone
H	aspiration or fortis fricatives	friction, noise	high tone
ʔ	prominant stops, ejectives	plain stops, creaky voice	laryngealized

The consonant system of SG is comprehensively described in Wiese (1996), as shown in (36). Wiese uses the feature [±voice] for Standard German plosives. In feature geometry [voice] is commonly used to distinguish between fortis and lenis plosives. As mentioned earlier, this relative labels fortis/lenis comprise several mechanisms to maintain this difference.

24 These elements can be interpreted depending on which coronal phonemes are contrastive in a given language. On a different view, concerning dark dentals, cf. Harris (2002).

Languages, such as Italian and French, distinguish in voicing, whereas English or Standard German differ in aspiration.

Jessen & Ringen (2002), among others, use the contrastive feature [spread glottis]. They argue that German plosives are voiceless utterance initially, unless they are preceded by a voiced sound, they are voiceless in word-medial clusters, as well as syllable finally, which is known as 'final devoicing', and there is no consistent voicing in intervocalic position. Instead there is a contrast between aspirated and unaspirated plosives word-initially and intervocalically. Voiced stops underwent 'passive voicing', where "stops can be voiced during most, or all of closure if they occur in the context of sonorant sounds, even if there are no active voicing gestures [...]" (Jessen & Ringen 2002:190). Additionally they claim that "passive voicing is phonetic, not phonological" (Jessen & Ringen 2002: 216). Beckman, Jessen & Ringen (2006) claim that, contrary to stops, German fricatives contrast in voicing[25] and that coda-devoicing is needed for fricatives. Unfortunately they restricted their experiment to the contrast between [s] and [z].

Remember that SG does not have a voiced velar fricative [ɣ] (Lüdke 1959, Hall 1989, Noske 1990). Moreover Noske (1990) also suggested that /j/ should be analyzed as a glide rather than a voiced palatal fricative. Therefore further underspecification is possible. The chart below is taken from Wiese (1996:165).

(36)	bilabial	labio-dental	alveolar	palato-alveolar	palatal	velar	uvular	glottal
Plosive	p b		t d			k g		ʔ
Fricative		f v	s z	ʃ ʒ	ç ʝ	x ɣ	χ ʁ	h
Nasal	m		n			ŋ		
Approximant			l, (r)		j		ʁ	

25 This distinction is absent in SAG.

Applying Backley's ET to the consonantal sounds of Standard German, we end up with the representations shown in (37). It has to be said that according to Backley, plosives contain |H|, even though the audible release is not a contrastive property. The most evident arguments for the presence of |H| in stops are spirantization and consonant weakening. Moreover he states that fortis fricatives are |H|-headed, but here it will be assumed that the fortis/lenis distinction can be made through headedness of |H| in all obstruents.

Note that in table (37) it is not decided whether coronals in Standard German are |I|- or |A|-coronals. Therefore these elements are bracketed. This will be discussed in grater detail later. The |U| in /l/ is bracketed as well, as Backley assumes the difference between 'dark' and 'light' /l/, i.e. the velar lateral and the palatal lateral, to lie in the former containing |U|, while the latter contains |I|. In BD /l/ contains both, as will be outlined later as well. Moreover, /r/ might also contain |I|, to serve as a palatalizing environment. Additionally, of course, [ç] is not an underlying ME. It is listed here for the sole purpose of displaying its discrimination from other MEs.

(37)	**I**	**U**	**A**	**L**	**H**	**ʔ**		**I**	**U**	**A**	**L**	**H**	**ʔ**
p		U			H	ʔ	b		U			H	ʔ
t	(I)		(A)		H	ʔ	d	(I)		(A)		H	ʔ
k		U			H	ʔ	g		U			H	ʔ
f		U			H		v		U		L	H	
s	(I)		(A)		H		z	(I)		(A)	L	H	
ʃ	I				H		ʒ	I			L	H	
ç	I	U			H		j	I					
x		U			H		h					H	
m		U		L			l	I	(U)	A			
n	(I)		(A)	L			ʀ,(r)	(I)		A			
ŋ		U		L			ʔ						ʔ

Furthermore Backley allows a single ME to contain more than one head element. In (37) /p/ is one example, where |H| gives us the fortis quality and |U| gives us labiality. This goes against the GP tenet against overgeneration. The number of MEs that can be distinguished using 6 elements and allowing just one head is already 256, i.e. more than the number of distinctive sounds in any natural language.

Backley does not go into details in his introduction to ET, but it has to be mentioned that he proposed an alternative to headedness elsewhere (Backley 1995). He argues that head-switching violates the structure preservation principle and therefore the whole concept of headedness is flawed. In his model of "element activation", he understands melodic oppositions as the activation of resonance elements already resident in the structure of melody (Backley 1995, Backley & Takahashi 1998).

Note that in Wiese's inventory, no underlying affricates are assumed. In ET, many argue against analyzing affricates as contour segments (e.g. Bloch-Rozmej 2011, Nasukawa & Backley 2008, Scheer 2003). Backley (2011) defines affricates as phonologically identical to plosives, but differing in their phonetic interpretation, i.e. their release is prolonged and enriched by audible resonance. Therefore, affricates are structurally simplex, but acoustically complex. To him, affricates are a performance device to enhance perception.

Moosmüller & Ringen (2004) looked at plosives in Austrian German. In CBD, plosives are not only voiceless throughout, but additionally there is no aspiration contrast between lenis and fortis plosives before /r/, /l/, /n/ and /m/. Furthermore, in CBD and SAG, lenis plosives can be pronounced as voiced fricatives. Intervocalically no contrast in aspiration was found; only the contrast in duration of closure was reliable. Intervocalic plosive clusters in SAG show the most striking difference to SG, as the first member of the cluster is often aspirated or affricated in SAG. A greater tendency to affricate was observed in velars. In SG on the other hand, the first member of the cluster does not bear affrication or aspiration, even though Jessen & Ringen (2002) only looked at /k/ plus plosive clusters. Word-initially, the

contrast in aspiration was observed in velars, but not as consistently in alveolars and bilabials. In word-initial position a tendency for affrication was found in alveolars and bilabials before a high vowel. Due to the tendency to affricate plosives, spirantization is analyzed as a result of affrication, where “the contact between the articulators becomes so weak that ultimately a fricative remains.” (Moosmüller & Ringen 2004:46).

Kühnhammer (2004) analyzes the CBD fortis/lenis distinction in obstruents as a structural simplex/geminate opposition, assuming Isochrony. There is no contrast for plosives in onset position, with the exception that word-initial simplex /k/ is in fact a velar affricate /kh/, explaining the difference between [g̊ɔatn̩] <Garten> 'garden' and [kʰɔatn̩] <Karte> 'card'. Kühnhammer's phonological inventory is given in (38), with the slight correction of adding a velar nasal. Here, Kühnhammer's analysis corresponds to the phonetic insights given by Moosmüller & Ringen (2004).

(38)

Plosives			Fricatives				Affricates				Nasals			Liquids and Glides				
p	t	k	f	s	ʃ	x	pf	ts	tʃ	kh	m	n	ŋ	l	r	w	j	h

To tie in with the earlier discussion, underlying affricates are needed in CBD, since isochrony spawns pairs like [koːb̥v]-[kɛpf] 'head' (sg./pl.). In contrast with SG, CBD have no voiced fricatives and no aspirated plosives. In assuming underlying lenis obstruents, i.e. containing non-headed |H|, the possibility opens up to analyse affricates as similar to SG fortis plosives. Therefore it is assumed here that affricates contain a |H|-head, as shown in (39).

(39)	**I**	**U**	**A**	**L**	**H**	**ʔ**		**I**	**U**	**A**	**L**	**H**	**ʔ**
p		U			H	ʔ	pf		U			H	ʔ
t	(I)		(A)		H	ʔ	ts	(I)		(A)		H	ʔ
k		U			H	ʔ	tʃ	I				H	
f		U			H		kh		U			H	ʔ
s	(I)		(A)		H		j	I					
ʃ	I				H		h					H	
x		U			H		l	I	(U)	A			
m		U		L			ʀ,(r)	(I)		A			
n	(I)			L									
ŋ		U		L									

To conclude, the inventory in SAG may be similar to the CBD inventory, shown in (39). We have correspondences of CBD /kʰ/ to SG /k/. SAG has no voiced fricatives. According to Moosmüller (2007b), and as stated earlier, the absolute duration of SAG vowels may correspond to the duration of SG vowels, but the timing has a Bavarian foundation. CBD vowel timing forms a direct relation to the timing of consonants. It is assumed that isochrony holds in SAG, for the time being. This assumption, however, requires affricates in the inventory. Furthermore, [ʔ] may be absent from SAG as well. Consider the SG example [ɛʁˈʔɪnəʁn] <erinnern> 'remind', which surfaces as [ɛʁʁˈɪnɐn] in SAG. However, creaky voice is observed occasionally.

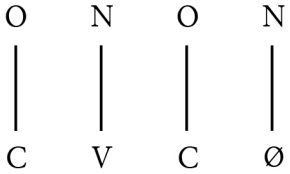
4.2 Structural Representation

MEs are arranged beyond the skeleton structure, where every skeletal point equals a timing slot in a phonological word. Skeletal points are linked to the higher-level phonological constituents forming the representation.[26] In Government Phonology, various representational theories have been developed. In this section, two of these are discussed: strict CVCV and VC-Phonology. Both postulate a strictly linear constituent structure at this level.

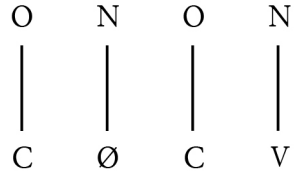
4.2.1 Strict CVCV

CVCV was first introduced by Lowenstamm (1996) and further developed by Scheer (1999, 2004). In CVCV, phonological constituents are understood as a linear string, where every O (consonantal, or onset constituent) is followed by an N (vowel, or nucleus constituent). Every other traditional category, e.g. coda, branching onset or boundary, has to be interpreted from structures involving more than one ON-pair. Below in (40)-(44) some possible constituent structures are shown, as translated into CVCV.

(40) closed syllable

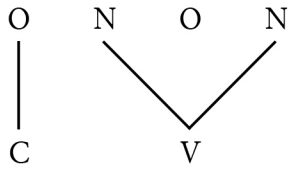


(41) branching onset

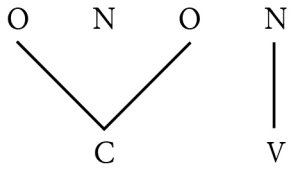


26 There is a debate about the need of skeleton slots. Without branching constituents, it is as well possible to assume the CV-string as the only skeleton structure.

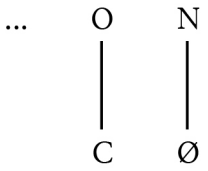
(42) long vowel



(43) geminate



(44) word final consonant



Two antagonistic forces guarantee that the constituent structure is well-formed: government and licensing, where, according to Scheer & Ségéral (1999:20), government inhibits segmental expression of its target and licensing comforts segmental expression of its target. Government as well as licensing operate from right to left.

All governing relations boil down to one principle, the ECP (empty category principle):

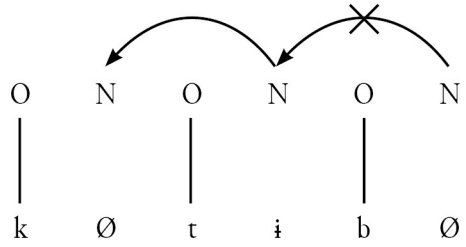
> A position may be uninterpreted phonetically if it is properly governed (KLV 1990:219).

Let us exemplify proper government with the classic /ktb/ example, involving the surface forms [tan ktɨb] 'I write' and [tan kɨtbuː] 'we write' in Moroccan Arabic. In (45) the rightmost nucleus (and in that particular example, every nucleus) is empty. The rightmost nucleus can remain unrealized by virtue of a special licensing mechanism for final empty nuclei (FEN).[27] But because the final nucleus is licensed, it cannot govern its preceding

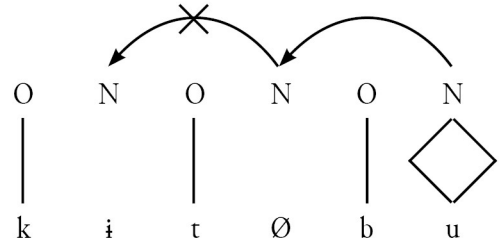
27 More on FENs is to be found later in this section.

nuclear position. Thus this position has to be expressed by phonetic interpretation, rendering a high central vowel [ɨ]. As the penultimate position is now filled, it is able to properly govern the first nucleus in the string, which therefore remains silent. In (46), on the other hand, the rightmost nucleus is filled by melodic material and so does not need to be licensed. It can therefore govern the penultimate nucleus, which stays unexpressed phonetically. However, because it is governed, this penultimate nucleus cannot govern the first nucleus, which again has to be interpreted as schwa (KLV 1990).

(45) tan ktɨb



(46) tan kɨtbu[28]



According to Scheer, the ECP is satisfied if one of three possible conditions hold:

- Proper Government
- Final Empty Nucleus
- Infrasegmental Government

The first two are taken from the traditional GP account, the last one is an extension that became necessary when generalizing the minimal CV structure into strict CVCV.

The FEN (final empty nucleus), i.e. the rightmost nucleus of a phonological domain (e.g. word), is parametrically licensed in a language that has phonetic word-final consonants. This final consonant is assumed to be followed by a FEN which remains unexpressed, even though it is not properly governed. Scheer argues that a FEN may govern and/or license its preceding constituents, which again is a question of parameter setting in a given language.

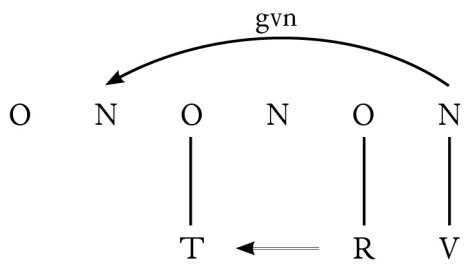
28 The final nucleus in this example is a branching constituent.

For example, in Moroccan Arabic, as seen in (45) and (46), the FEN parameter is active, but the FEN may neither govern nor license its preceding constituents.

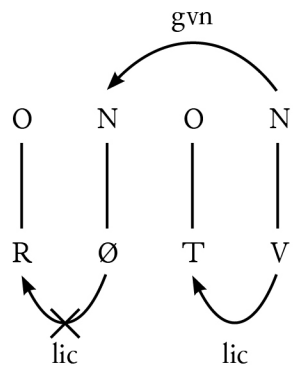
Infrasegmental Government (IG), holds between two consonants of unequal sonority, where the right one, the head, is the more sonorous, as every government and licensing operations apply from right to left. In between these two consonants (TR-clusters) a nucleus may remain unexpressed and moreover the nucleus following the cluster is able to govern the nucleus preceding the cluster. This is shown in (47). Note that sonority again is a category that has to be derived theory-internally. Scheer proposes his own calculus of complexity of MEs, which ensures that TR is licensed.

The reverse structure, RT-clusters, will never establish an IG relation, as the head of the cluster has to be licensed by the nucleus following it, which is not possible as the more sonorous part is followed by an empty nucleus that is unable to license anything. Therefore every RT-cluster has the structure of coda-onset, as exemplified in (48).

(47) infrasegmental government



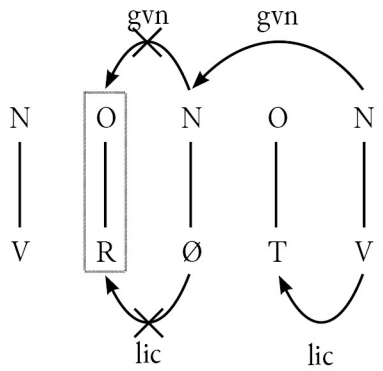
(48) RT-cluster relation



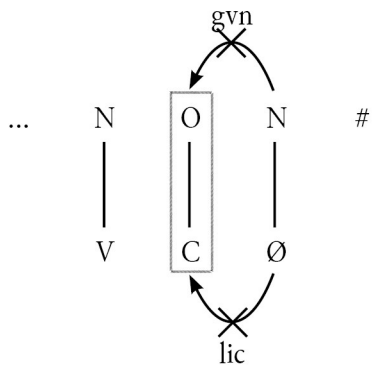
Coda is another category derived from structure-internal conditions. The observation that codas are more likely to undergo lenition processes can be explained by reference to the governed empty nucleus following it, which, again, is unable to license its preceding consonantal position. The reverse case is a consonantal position after a governed empty nucleus, which is licensed and therefore in a strong position and unlikely to undergo

lenition. A consonant may find itself in one of five possible positions: internal coda (49), final coda (50), post-coda (51), word-initial (52), and intervocalic (53). It is known that coda positions as well as intervocalic positions are classified as weak, whereas word-initial and post-coda positions are strong. Scheer calls this the 'Coda-Mirror'. Leaving intervocalic positions aside, the positions can be summarized as preceding or following an empty nucleus. The former, known as coda positions, are unlicensed as well as ungoverned, which make them weak.

(49) internal coda

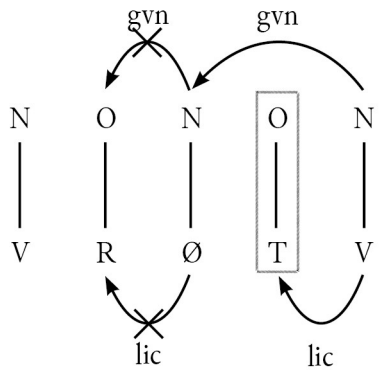


(50) final coda

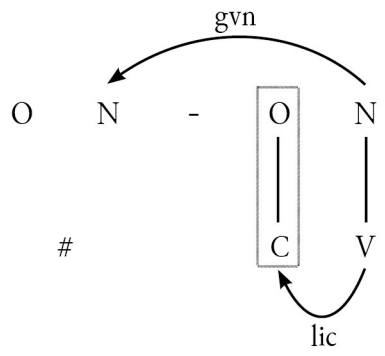


The Coda-Mirror image, however, is a position following an empty nucleus, meaning that it precedes a realized nuclear position, which is able to license its onset and govern the empty position to its left. Hence the consonantal position is licensed but ungoverned. As licensing supports the expression of its target, the position is a strong one.

(51) post coda

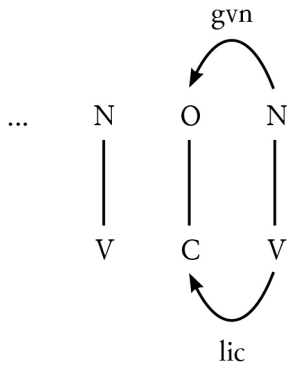


(52) word initial



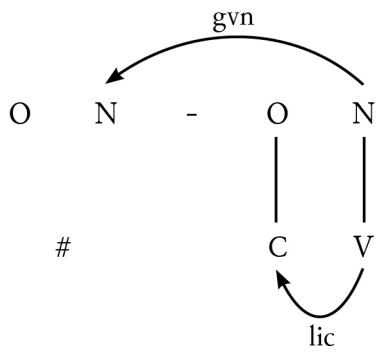
Intervocalic positions are licensed and governed, and the additional governing relation weakens the position, as government suppresses realization of its target. Thus two different types of weak are recognized. This fits with cross linguistic observations that lenition processes like devoicing or liquid vocalization are common in coda positions, but improbable intervocalically, whereas voicing, for example, typically appears in intervocalic positions, but is unlikely to occur in codas.

(53) intervocalic

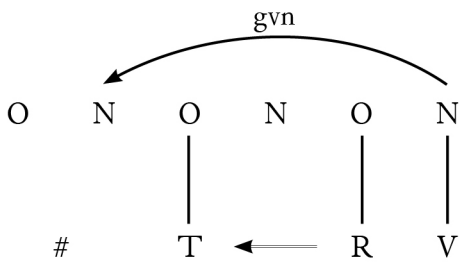


Another crucial argument is the “getting rid of diacritics” approach, where even boundaries have to be mapped into phonologically interpretable material. Scheer (1999), following Lowenstamm (1994) proposes an initial empty CV that has to be taken into account in satisfying the ECP. (54) shows an initial CV-unit governed by its following nucleus position, which makes the structure well formed. Under (55) a word-initial TR-cluster is shown, where (CV) equals the word-boundary, formerly known as '#'. Initial RR-clusters, i.e. clusters of equal sonority, such as /rl/, /nr/, etc. as well as TT- clusters, such as /pt/, /kp/, etc. are ruled out, because proper government fails to govern the nucleus within the empty initial CV-unit. Initial clusters of equal or falling sonority are of course found in the languages of the world. Under this account, such languages have no initial CV-unit. This predicts, however, that those languages lack strong boundaries between phonological words and therefore word initial positions are more likely to undergo phonological processes.

(54) Consonant-initial word



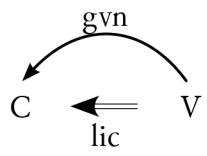
(55) word initial TR-cluster



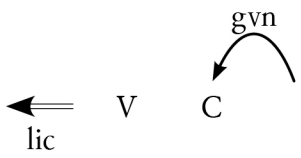
4.2.2 VC Phonology

Szigetvári (1999) proposed the reverse structure: VC-Phonology (henceforth VCP). Even though it looks very similar, the predictions made are quite different. The most fundamental one might be that a VC-unit has no unit-internal governing or licensing relations, whereas CV is built to have onset-licensing from its head, the nucleus position, which licenses its dependent, the onset. The fundamental claim is that the basic unit VC is understood as an inseparable unit and in itself is glued together. Every government and licensing relation works away from the unit and not inherently. This is shown in (56) and (57). Note that Szigetvári uses single curved arrows to indicate government and the double straight arrows to indicate licensing, which will be adopted here.

(56) CVCV gvn and lic relations



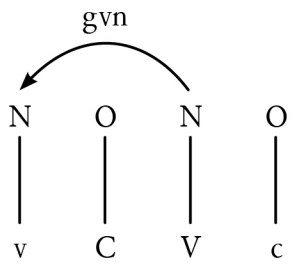
(57) VCP gvn and lic relations



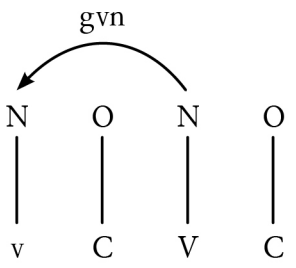
Also, government and licensing are understood differently. According to Szigetvári, vowels and consonants are fundamentaly different constituents, where vowels like to be pronounced and consonants like to stay mute (cf. Harris 2008). Therefore government is understood as spoiling the inherent properties of its target and licensing supports the maintenance of melodic material in a position (Szigetvári 1999). This means that a governed nucleus is allowed to be unexpressed, whereas a governed onset needs to be pronounced. Licensing on the other hand allows a consonant to remain mute and a vowel to be expressed. In Szigetvári's notation, capital letters indicate expressed MEs, whereas the lowercase shows mute MEs. Government as well as licensing relations go from right to left, just as they do in

CVCV. Note that CV still is the most unmarked syllable type, which is understood as two VC units, where the final consonant is mute, because it is not governed, whereas the initial V remains unexpressed, because it is governed by the filled nucleus to its right. Thus, without a FEN, no FEN-licensing is needed.

(58) CV syllable

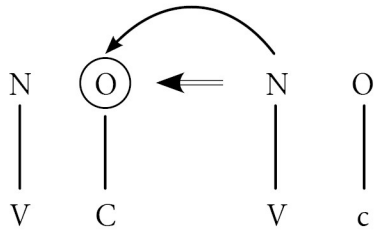


(59) closed syllable

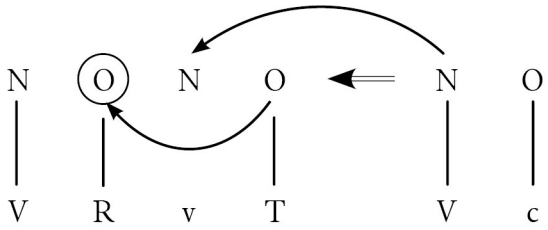


This view also predicts a different view on strong and weak positions. As already seen in Scheer's CVCV account, different cluster types are derived structure-internally. VCP has a different view on some of those. Consonants in intervocalic position are licensed and governed, just as in CVCV (60). Unlicensed but governed consonants are found in RT-clusters, forming a C-to-C government relation (61) and as mute and buried consonants between long vowels or diphthongs (62). A governed but unlicensed C should not be allowed to remain mute, but Szigetvári assumes a special mechanism, V-to-V licensing, to bury the C. Clusters with rising or equal sonority, i.e. TT, RR and TR clusters in Scheer's terms, do not have C-to-C government, so the left consonant of the cluster is unlicensed as well as ungoverned (63). Here lies another basic difference, as in CVCV, TR-clusters are understood as special in the sense that they have an infrasegmental governing relation. In VCP, RT-clusters are the special ones, which allows the theory to additionally differentiate bogus clusters.

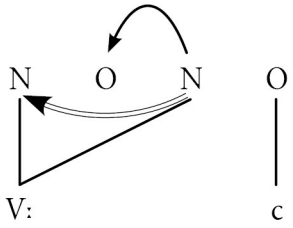
(60) licensed and governed



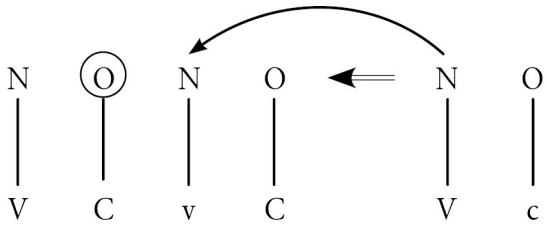
(61) not licensed but governed; RT



(62) not licensed but governed; buried



(63) unlicensed and ungoverned



5 Analysis

As outlined in section 2, we assume that [ç] derives from underlying /x/. In ET, palatalization requires spreading of an |I| element, i.e. whenever a ME preceding [x] contains |I|, it spreads to the ME of [x], |U,H|, to form the ME |I,U,H|, which surfaces as [ç]. We have also seen that front vowels contain |I| and back vowels do not. Hence the distribution after vowels is straightforward.

Therefore the only problems concern the consonantal environments. Backley distinguishes the 'dark' velar lateral [ɬ] and the 'light' alveolar lateral [l], as the former ME consists of |U,A| and the latter is composed of |I,A|. In SG and SAG /l/ is pronounced as an alveolar lateral. From that we may conclude that /l/ contains an |I| element in SAG and SG. It might also contain |U|, at least in BD.[29] In BD the /l/ in coda-positions is vocalized. This process involves rounding its preceding vowel as shown in (64a), where the /l/ is deleted. (64b) shows that following lexically rounded vowels, the /l/ surfaces as /i/. In (64c) it is shown that the /l/ surfaces intervocalically. The spreading of |U| and the deletion or reduction of /l/ are two distinct processes, since deletion does not occur in SBD although rounding does. The right column of (64c) shows that the /l/ remains after adding clitic pronouns as well, at least in some varieties of CBD, including VD.

(64)	a.	['myːç]	Milch	'milk'	['b̥yːd̥l̥]	Bild	'picture'
		['kœːç]	Kelch	'goblet'	['g̥œːd̥]	Geld	'money'
	b.	['d̥oiç]	Dolch	'dagger'	['hoid̥z̥]	Holz	'wood'
		['muiç]	Mulch	'mulch'	['muid̥n̥]	Mulde	'hollow'

29 One problem arises with this view, as in male VD speakers the alveolar and the velar lateral are in complementary distribution.

	['ʒ̥ʏ̥ɔiç]	Schwalch	'fumes'	['ɔid̥]	alt	'old'
c.	['kœːlɐ]	Keller	'basement'	['ʏ̥æ̥ːli]	weil ich	'because I'
	['ɔːlɛ]	alle	'all'	['ʏ̥yːli]	will ich	'want I'

We determined that /l/ contains |I|, but what about the other sonorants? Scheer (2004) argues that /l/, /r/ and /n/ contain |I|, as they form a natural class in German. He uses the distribution of [ç] and [x] to corroborate this assumption. Robinson (2001) walks the same road, as he quotes Glave (1974), who found three distinctive spectral energy-concentration values for [ç], where [l], [n] and [R] pattern together with [œ] and "lie right in the center of the range, lower than after the front unround vowels and higher than after the front round vowels" (Robinson 2001:85).

Furthermore, he writes that /r/ is a "phonetically natural environment for [ç]" (Robinson 2001:78). He states that a change from /s/ to /ʃ/ following /r/ is found in a number of High German dialects, such as the ones spoken in Leibzig, Hessen and Thüringen. Two widespread examples are Wur[ʃ]t 'sausage' and er[ʃ]t 'firstly'. This view is problematic, since it cannot be assumed to have been an active process in the history of High German. Rather, the opposite happened. Remember that early codification of Standard German was based upon Central High German varieties, where Leibzig, Hessen and Thüringen are located. In High German varieties those spirant-plosive clusters were articulated with the palatoalveolar fricative. Later in the codification process, Siebs added Low German sound values to the High German based standard. For that, word-medial and word-final spirant-plosive clusters are articulated with the alveolar fricative in Modern Standard German, whereas word-initially the palatoalveolar fricative remained. In BD, especially SBD, such as Tyrolian, palatoalveolar spirant-plosive clusters are still very common, not only in <Wur[ʃ]t>, but also in <ha[ʃ]t> 'have' (2nd sg.), <Lu[ʃ]t> 'lust' or <We[ʃ]penne[ʃ]t> 'nest of wasps', for example. Maybe Robinson would argue here that, even though the palatoalveolar fricative preceding plosives

is earlier in Central German, the influence of standard has been around long enough to interfere and we therefore have to account for cases like that in phonology.

Let us apply Backley's element theory and ask the question what kind of coronals we have in German. Do they behave like |I|-coronals, |A|-coronals or do they contain both? Translating Robinson's view into ET, we have to assume that [s] contains |A, H| and receives it's |I| element from /r/ containing |I.A|. Then we somehow have to get rid of the |A| element in the process to end up with the ME |I.H|. This doesn't seem very convincing, as we would have to assume two antagonistic processes, i.e. the assimilation of |I| and the lenition of |A| in a structurally strong position. Assuming the opposite, [s] containing |I.H|, the difference in the two phonemes has to be maintained through headedness alone, since Backley assumes palatals to contain headed |I|, whereas other coronals may contain an |I|-operator. The most tempting analysis is to assume that German coronals contain both |A| and |I|. In that case just the |A| element has to be delinked, or suppressed from the ME to surface as [ʃ]. Additionally there is no need to assume this process to be palatalization triggered by /r/. If we state that coronal alveolars contain |A| as well as |I|, /n/ contains |I| and [ç] as the surface form following /n/ is no accident.

A digression to the difference between *delinking* and *suppressing* melodic material is in order. In GP melodic material is never lost. However it may become phonetically uninterpretable due to its structural environment. Szigetvári (2008) assumes melodic material to be delinked from its constituent and for that it is no longer interpretable. In Backley's view on element activation, on the other hand, MEs remain linked, but weak constituents provide no environment that allows full interpretation of complex MEs.

Other processes, discussed earlier, can be analyzed in the same manner. /g/-spirantization is a lenition process, as the elements in /g/ are |U.H.ʔ| and the ones in [x] are |U.H|, with additional fricative assimilation of a spreading |I| element.

The situation of [ç] → [ʃ] is not as clear. Recall that according to Robinson "[...] the change of [ç] to [š] in German colloquials should in some way or another be describable as a simplification." (Robinson 2000:99). According to Backley's definition, [ʃ] contains a headed |I| element and an |H|-operator. This would fit the purpose here, as [ç] contains |U.I.H| and by suppressing or delinking the |U|element |I.H| remain to form [ʃ]. A problem arises with this analysis because it is unclear why this lenition happens. Lenition takes place in structurally weak positions. As we have seen earlier, this sound change appears in Onset and Coda-Mirror positions, i.e. structurally strong positions. Therefore it has to be assumed that even strong positions are target positions for losing privative primes. Scheer writes that positions formally known as coda positions are more likely to undergo lenition. This does not mean that strong positions must not change. Furthermore, Backley states that |I| and |U| are antagonists in the sense that their mapping into the physical world is rather oppositional. Therefore, MEs containing |I| as well as |U| are rare and their avoidance is not uncommon.

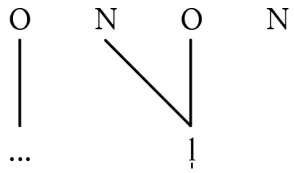
Back to the matter at hand: We stated that /l/ and /n/ contain |I|, but what about /r/? Robinson (2000) dug deeper into Thuringian, which shows the fronting of older [x] to [ç], older [ɣ] to [j̧] or [ç], and the, so called, palatalization of [s] to [ʃ], but also shows a palatalizing effect of /r/ on preceding back vowels, leading to surface forms like dɐ̯ʳ[ç], <durch>, 'through' and møːʳ[ç]n, or møːʳ[j]n, <Morgen>, 'morning'. The /r/ in these examples is described as having either disappeared or reduced to an [ɐ̯]-like sound (Robinson 2001).

For argument's sake, let us assume that Thuringian has an impact on SG, since Central German speakers are considered to speak the 'most proper' or 'purest' SG. Furthermore, phonological processes shape the interpretation of underlying MEs in first language acquisition. Hence, we assume that /r/ consists of |I.A| in SG, similar to Scheer (2004).

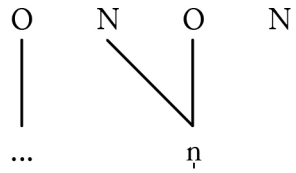
Conversely, since /r/ does not trigger surface [ç] in BD and SAG, the ME of /r/ consists solely of |A|.

In CVCV, vocalization can be analyzed as a similar mechanism to syllabic consonants. Scheer points out that syllabic consonants are not delinked from their consonantal position but branch to their preceding nucleus position, not as a repair strategy to satisfy the ECP, but in their own right (Scheer 2004). This might explain the different mechanisms in SG (i.e. inducing schwa), and SAG (i.e. syllabifying the sonorant). In (65) and (66) syllabic sonorants are shown, as understood in CVCV.[30]

(65) syllabic /l/

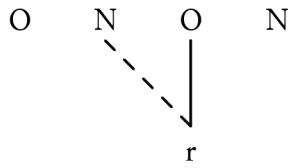


(66) syllabic /n/

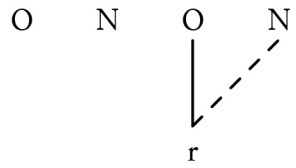


The mechanism for /r/-vocalization might be examined as taking syllabification one step further. The ME is delinked from its onset position and remains as a floating |A| element that spreads to its preceding or following nucleus and is realized as an offglide, as exemplified in (67) and (68).

(67) regressive spreading



(68) progressive spreading

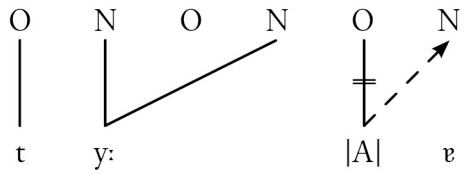


30 Note that the MEs are not displayed in the following examples. Instead the interpretation of each ME, written as a phonemic letters, is shown in the constituent the ME was originally linked to.

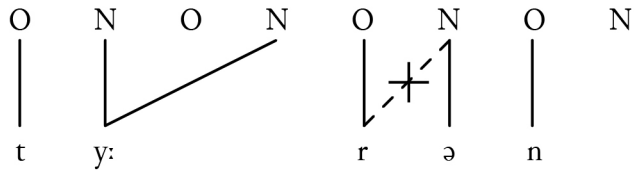
/r/ undergoes vocalization when it finds itself in an unlicensed position, i.e. a position preceding an empty nucleus. Hence, roughly speaking, the position is not strong enough to sustain its melody. In intervocalic position, the /r/ remains, because the following nucleus contains melody and therefore is able to license its preceding onset.

Since a (so-called) coda position precedes an empty nucleus, one might be tempted to analyze the SG example <Tür> (sg./pl.) as progressive spreading, where the schwa in the plural prevents the offglide to surface, as outlined in (69) and (70).

(69) Tür



(70) Türen



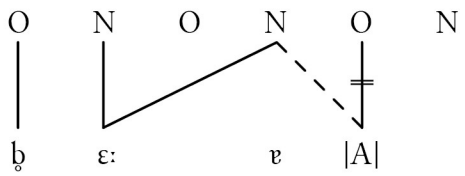
However, much is wrong with this few. First of all, [ə] is not an ME that is linked to a constituent, but the penultimate nucleus is unlicensed and because it is unlicensed, it has to be interpreted. It could not inhibit spreading, which would lead to the surface form *[tyːʁɐn]. Moreover, as seen in /l/-vocalization, spreading and delinking are two different processes. This can be observed again in SAG and BD, where the offglide precedes the /r/ whether the /r/ itself surfaces or not. Contexts preventing the offglide from spreading are

preceding diphthongs and preceding consonants, after vowel-initial suffixes have been added. This is seen in (24), which is repeated here as (71) with an additional column, displaying the VD correspondences, as complementarily lengthened monophthongs behave like diphthongs in this case.

(71)		SAG	VD	
C_	<fiebrig>	['fiːb̥ʁɪg̊]	['fiaβ̊ʁɪç]	'shivery'
	<eifrig>	['aɛfʁɪg̊]	['æːfʁɪç]	'avid'
VV_	<bairisch>	['b̥aɛʁɪʃ]	['b̥æːʁɪʃ][31]	'bavarian'
	<schaurig>	['ʃaɔʁɪg̊]	['ʃɒːʁɪç]	'eerie'
V(ː)_	<gierig>	['g̊iːᵉʁɪg̊]	['g̊iːᵉʁɪç]	'greedy'
	<-spurig>	['ʃb̥uːᵉʁɪg̊]	['ʃb̥uːᵉʁɪç]	'-tracked'

Thus, in these cases, it has to be regressive spreading. First CBD will be discussed. We have to assume that the penultimate nucleus position, even though it is already occupied, sustains the floating melody. Consider a monosyllabic example, as shown in (72) [b̥ɛːɐ], <Bär>, 'bear'. Due to isochrony, we know that the vowel is long. Again, isochrony is understood as a structural opposition between VːC and VCː (where *VC and *VːCː are not allowed).

(72) Bär 'bear'

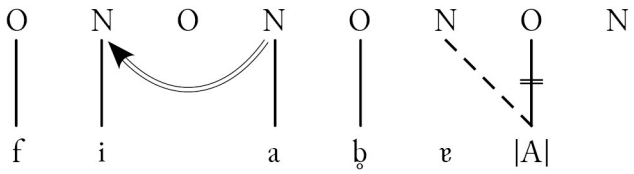


Let us now work our way through the cases shown in (71). The alternation [fiaβ̊ɐ]-[fiab̥ʁɪg̊]/[fiaβ̊ʁɪç] 'fever' (noun/adj.) provides an easy case, since in the latter, proper government

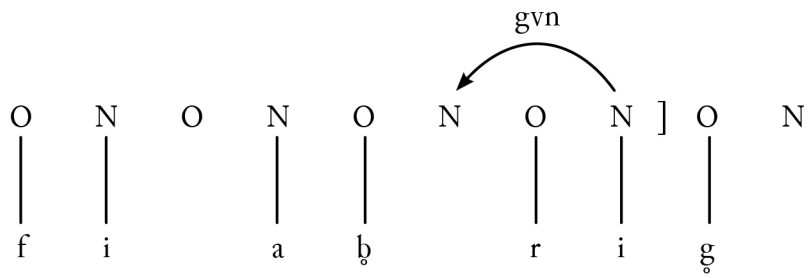
31 In some BD, the surface form is [b̥ɔɐʁɪʃ], due to the input-switch [aɛ]↔[ɔɐ].

prevents the nucleus position preceding the /r/ from being realized phonetically after the suffix is added. The lexical representation of the suffix has to be assumed to be one ON-pair with the ME forming [g̥] linked to the onset position and a floating |I| element that associates with the former FEN position. The representations are given in (73) and (74). Note that this is the representation for CBD, where SAG /i/ corresponds to CBD /ia/.

(73) [fiaβ̥ɐ]

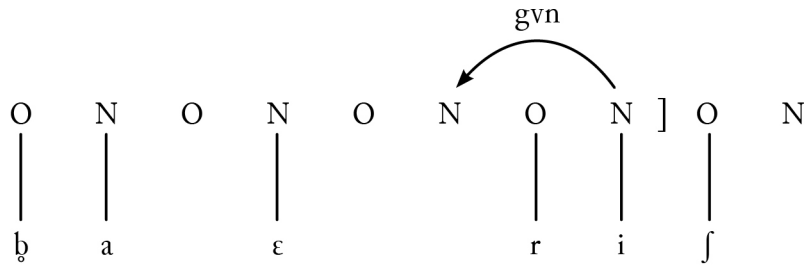


(74) [fiab̥ʁɪg̥]

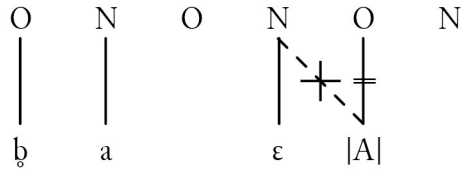


The pair <Bayer>-<bairisch>, on the other hand, is problematic. Consider a representation as shown in (75), which is drawn by analogy to (74) above. At first glance the structure seems well-formed, but the ON-pair, governed by the nucleus containing /i/ has no motivation.

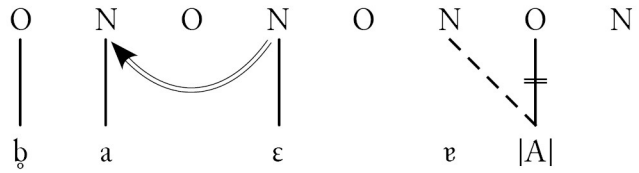
(75) [baɛʁɪʃ]



(76) [baɛɐ], small structure



(77) [baɛɐ], heavy structure

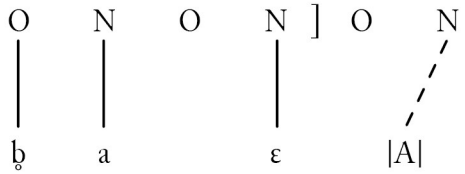


By shrinking down the structure, the filled nucleus containing [ɛ] would prevent the /r/ from spreading, but so would it in the case of <Bayer>, where we need to allow the offglide to surface, as seen in (76) and (77). By spreading the |A| to the right, the problem remains, since we would allow the ME of |A| to surface in both cases. Therefore, this extra ON-pair is needed. One possibility comes to mind. We can make use of corresponding domains in dialectal variation. Since, roughly speaking, the [ɐ] corresponds to a SG suffix <-er>, we could state that this suffix requires two ON-pairs in BD too. Despite the fact that this is very counter intuitive, the correspondence with <-er> would need to hold for <Fieber> too and the analysis given in (73) would not hold.

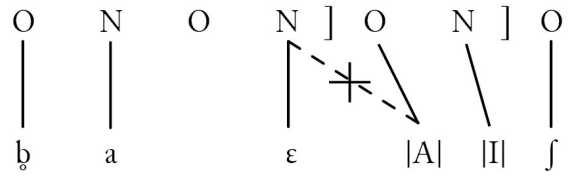
Another possibility would be to assume the underlying representation of this suffix in CBD to be one ON-pair with an |A| element that is not associated with the onset position by default, but can attach either to the nucleus, in the case of [baɛɐ] (78), or to the onset in the case of [baɛʁɪʃ]. Since the |I| element of <-isch> occupies the former final nucleus, |A| is linked to the preceding onset, as shown in (79). Intrusive /r/ in VD shows the possibility for

|A| to spread progressively as well, which will be discussed later in (96)-(98).

(78) [baɛʁ]

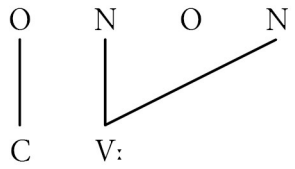


(79) [baɛʁɪʃ]

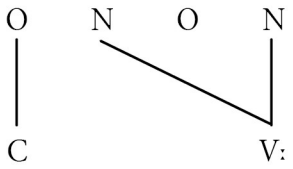


But then, what about the Viennese monophthongs? With a structure as seen in (76), the offglide would surface, just like in the <Bär> example (72). Scheer (2004) states that alternating long vowels are head initial (80), whereas non-alternating long-vowels are head final, (81). We have seen that vowels alternate heavily in VD, due to isochrony. In contrast, the monophthongs underwent compensatory lengthening in their change from diphthongs. Therefore it can be said that the head-final structure prevents the spreading of |A| to its preceding nucleus position.

(80) head-initial long vowel



(81) head-final monophthong



Rennison & Neubarth (2003) may provide an explanation for this structural difference. In their framework, the minimal unit is two ON-pairs, i.e. one F°. Rennison & Neubarth (2003) use licensing in the more traditional sense, where every phonological position has to be licensed. In their model C and V (or O and N, respectively) form a constituent of higher order, where licensing of onsets takes place automatically by virtue of the nucleus-head. Government holds between these higher constituents ($\bar{x}$) and comes in two flavors: C- and V-government. The latter is just proper government, but c-government is sensitive to strength relations between the onset constituents. Although their calculus of strength is not very intuitive, it maps sonority to melodic configurations, not unlike the suggestions made by Harris (1994) and Scheer (2004).

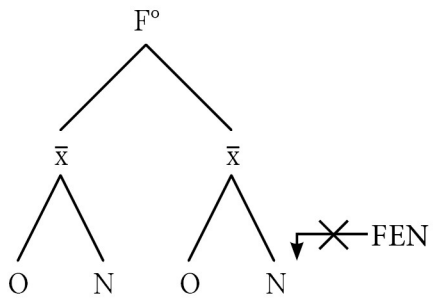
In their proposal, geminates and long vowels form a relation in their own right. With long vowels, the second nucleus is licensed by interpretation, since the ME of the first nucleus is associated with it by spreading. Geminates are a special case of C-government. They have to stipulate branching onsets as a special case of onsets that allow for structured MEs.

In terms of Rennison & Neubarth (2003), the ECP is satisfied, when one of these operations occur:

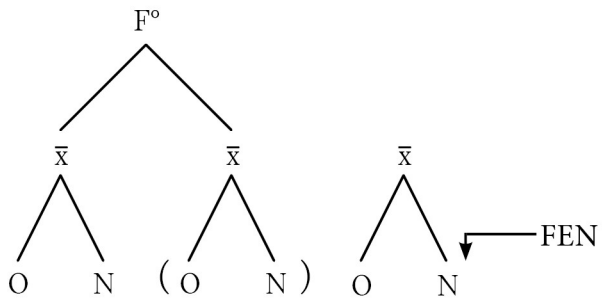
- c-government, including
  - IG
  - geminates
- v-government, including
  - PG
  - FEN (parametric)

Additionally, Rennison & Neubarth (2003) propose that on a higher prosodic structure, the Foot F°, obligatorily consisting of two CV units, interferes with government and licensing operations in some languages, such as German. It forms a sub-domain that cannot be penetrated by v-government, including FEN-licensing,(82). Therefore an additional CV-unit has to be inserted, (83), which explains processes like tonic lengthening, or isochrony.

(82) Fº structure

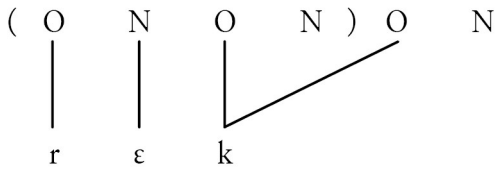


(83) inserted CV- unit

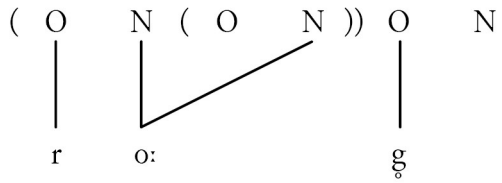


Consider the example [roːg̊]/[rek], 'skirt' (sg./pl.). When the plural suffix, a melodically empty ON-pair, is added, the onset position containing /g̊/ forms a geminate structure with the onset of the plural suffix (84). In the singular, though, FEN-licensing would penetrate the Fº domain, which is not allowed. Therefore a ON-pair is inserted between the first and second ON-pair, i.e. after the stressed syll. Now the nucleus position N1 associates with the newly created N2 to form a long vowel (85). The Fº domain is displayed in brackets, as well as the inserted ON-pair in the latter example.

(84) [rek]

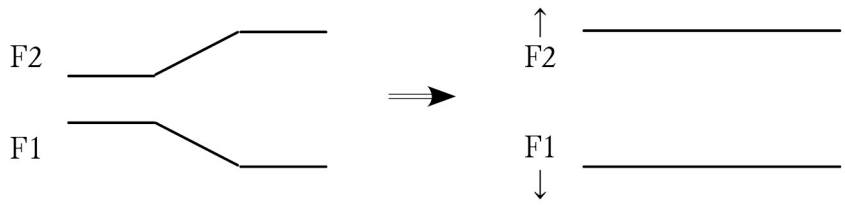


(85) [roːg̊]

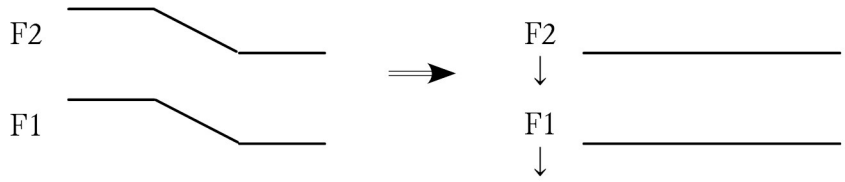


An additional indication for analyzing VD monophthongs as head-final can be found in the phonetics of the VD monophthongs. In (86) and (87) the change of the formants F1 and F2 is shown as a schematic image, where (86) shows the change from [aɛ] to [æː] and (87) displays the change from [aɔ] to [ɒː]. It can be seen here that in VD the formants changed towards the second part of the diphthong's quality (Sylvia Moosmüller p.c.).

(86) [aɛ] to [æː]

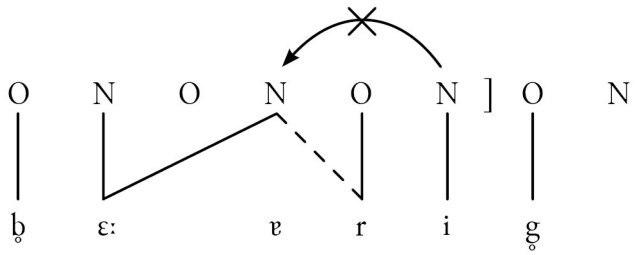


(87) [aɔ] to [ɒː]



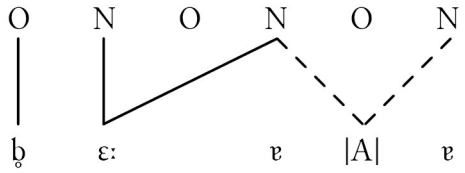
Therefore, when adding <-ig> to the initial example <Bär>, proper government cannot prevent the offglide from surfacing since, again, the non-head nucleus position is already associated with its head. We get [bɛːʁɪg̊], which is the right surface form, as shown in (88).

(88) [bɛːʁɪg̊]



One problem remains. When assuming the suffix <-en> to be a ON pair with a 'floating' |A| element, as shown in (78), that attaches either to the final nucleus or its preceding onset, the structure in <Bär> would provide too much room for the schwa. This is shown in (89).

(89) [bɛːɐ]

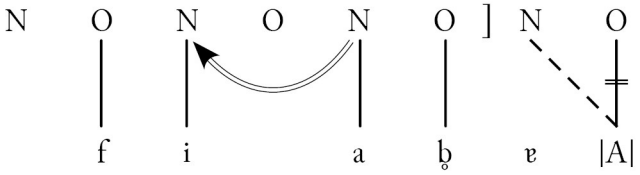


VCP deals with this cases more elegantly. Consider again the pairs <Fieber>-<fiebrig> (90)/(91), <Bayer>-<bairisch> (92)/(93) and <Bär>-<bärig> (94)/(95). There is no need to assume floating melody in the underlying suffixes. All that is needed is for a governing relation from the filled nucleus of the suffix to govern the nuclear position to its left. Only, V-to-V licensing, as an impregnable stronghold, holds for diphthongs and monophthongs, but as we can see here, long vowels need to be treated differently.

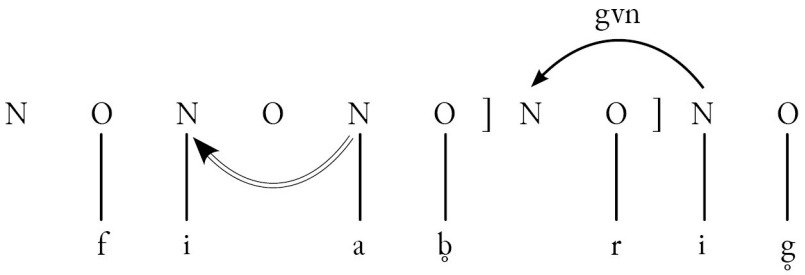
Again, in (95), as well as in (88), proper government cannot occur, since the nucleus position is already occupied, i.e. a licensing relation is established in its own right. On the other hand, a non-head nuclear position does not inhibit spreading of the |A| element. Rennison & Neubarth (2003) proposed an explanation for this kind of alternating long vowels. Government as well as licensing relations apply regressively in a strictly linear structure. Furthermore, the nucleus is the head of a higher projection (the foot), as Rennison & Neubarth (2003) pointed out.[32] This implies that the regular head-dependent relation is head-final. In line with this chain of thought, it is unclear whether every head-final nucleus relation or solely diphthongs establish a V-to-V licensing relation in VCP.

32 In classic GP, the nucleus projected to a higher structural level as well. Otherwise the ECP would violate the strict locality principle.

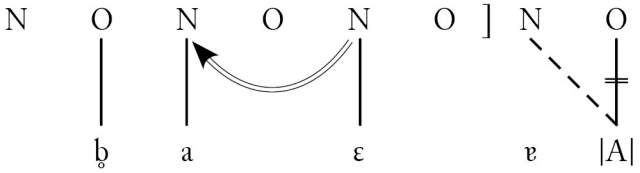
(90) Fieber



(91) fiebrig

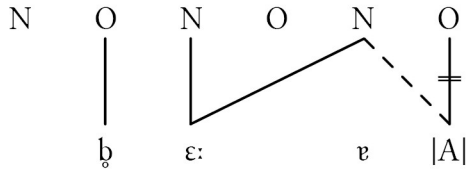


(92) Bayer

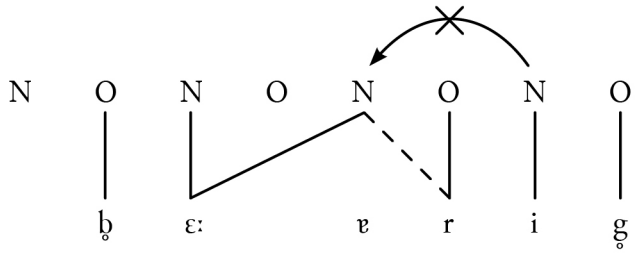


(93) bairisch

(94) Bär



(95) bärig



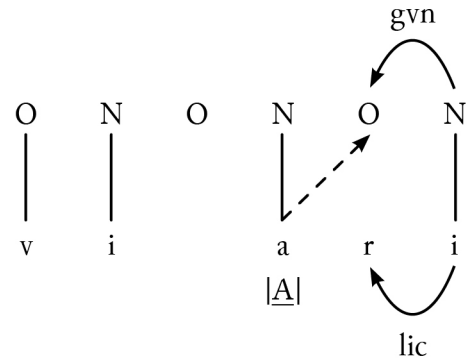
One further indication for /r/ being a simplex ME solely containing |A| is the phenomenon of intrusive /r/ in VD. Intrusive /r/ seems to be progressive spreading of an |A| element, to the licensed as well as governed consonantal position provided by a following pronoun. Intrusive /r/ may occur whenever an |A| element is involved. Thus [gɛː ʁ i] <gehe ich> 'I go' is possible as well as [ʃɒː ʁ i] <schaue ich> 'I look', whereas e.g. *[miː ʁ ɔːβ̥a] <mich aber> 'but me' is ruled out. Consider the inflectional pattern for one of the examples in (25) [wɪɐ r a] <wie er> 'as he'. It is safe to assume that these pronouns have no initial CV unit, but are inflectional or even clitical forms.[33] Only in intervocalic positions does optional intrusive /r/ surface, as shown in (96).

33 For further references concerning this discussion, please consider Gruber (2008) and literature therein. Gruber states that the second person pronoun is a 'mixed form' between inflectional form and clitic.

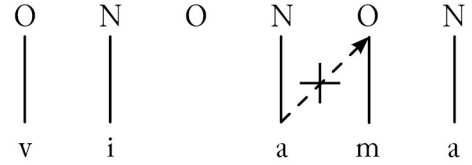
(96)	sg.	pl.
1st pers.	[wɪɐ ʁ i]	[wɪɐ ma]
2nd pers.	[wɪɐ sd]	[wɪɐ s]
3rd pers.	[wɪɐ ʁ a] (masc.)	[wɪɐ s]
3rd. pers.	[wɪɐ s] (fem./neut.)	

Consider the 1st person singular and plural pair. In the singular form, the |A| spreads to its following empty C position and surfaces as /r/, as shown in (97). The spreading is prohibited in the plural form, as the C position already contains melody, as exemplified in (98). An initial CV unit blocks the spreading of |A|, which explains the lack of intrusive /r/ in non-pronominal vowel-initial environments. The C-position in the empty initial CV unit (formerly known as #) is not licensed and therefore less eager to be filled.

(97) [wɪɐ ʁ i]



(98) [wɪɐ ma]

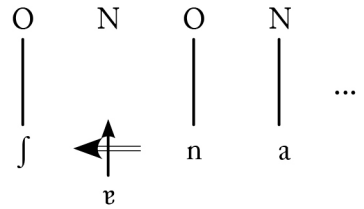


For the sake of completeness, let us have a look at "intrusive [ɐ]" which is clearly breaking up a tautosyllabic cluster. In CVCV terms, such a cluster has an IG relation (99). A certain effort is needed by a speaker to split up a tautosyllabic cluster, which is indeed the case for these examples. It shows, however, that these complex onsets bear a silent nucleus position, which can be filled. This position is then filled with the default schwa, which happens to be [ɐ] in

CBD, as stated earlier in (26). Note that in VCP, this type of cluster does not contain a C-to-C governing relation.

It has been stated in quite some detail that /r/ in BD can hardly be more than the element |A|. The fact that SAG speakers also produce [x] rather than [ç] indicates that the same is true for SAG.

(99) Initial TR-cluster of [ʃɐnapsɐl]



For the situation in Germany, i.e. SG as well as North and Central German varieties, it was said that /r/ contains |A.I|. The question is now, what to do with the |I|, when /r/ is vocalized, since the interpretation of the full ME |A.I| would give us [ɛ]. Since in some cases the nucleus receiving the elements is already partially occupied, we may say that only one element can associate with this position. How do we decide which element is the lucky winner? The easiest assumption that comes to mind is to state that |A| is head. In Backley's ET |A|-headed consonants are either pharyngeal or retroflex. Unfortunately, German /r/ is neither. On the other hand, ET is clear on the notion that its elements are abstracted entities with no direct mapping into the physical world. Therefore, since we argued that German coronals contain |A| and |I|, an |A| operator indicates coronals. An |A|-head, on the other hand, may indicate backness; not pharyngeal backness, but enough backness to give us a uvular fricative. Further, the |I| element in /r/ has to remain uninterpreted unless it attaches to a following onset, causing palatalization.

To round up, let us finish as we started. The diminutive suffix <-chen> can be analyzed in different ways. Note that in the varieties where <-chen> is productive, it also triggers Umlaut. This would mean that a floating |I| element in the suffix triggers Umlaut as well as the change from underlying /x/ to [ç], showing that |I|-spreading can be progressive and regressive.

5.1 Summary

In this section we have seen that /r/ in CBD and SAG behaves in a more glide-like way than its SG equivalent, indicating that SG /r/ is a melodically more complex segment. This supports the assumption that the ME of SG /r/ is |I.A|, whereas the /r/ in CBD and SAG consists solely of |A|. To summarize, it can be said that vocalization processes are divided into two separate events:

- Spreading of elements to an adjacent nucleus position.
- Inhibiting the interpretation of the ME in its onset position.

Spreading may occur without delinking or suppressing the phonetic interpretation of the ME in the onset position, but if the interpretation in the onset is inhibited, spreading occurs. In the case of /r/-vocalization it can be said that

- Spreading may be inhibited.
- Spreading may be progressive or regressive.
- The phonetic interpretation of /r/ is sustained when the onset is licensed and governed.

By investigating the inhibition of spreading, differences between long vowels and diphthongs (and monophthongs respectively) were detected. Commonly, long vowels and diphthongs are

both understood as occupying two skeleton slots, with the one difference that in case of a long vowel, one single ME is associated with both of these positions on the skeleton. Since VD shows different behavior of long vowels and monophthongs, further considerations were taken into account and the following assumptions were made:

- Headed nuclei inhibit spreading.
- Long vowels are head-initial and consequently they do not inhibit spreading.
- Monophthongs are head-final and consequently inhibit spreading.

Furthermore, in Backley's ET account, a difference is made between |A|- and |I|-coronals. It was argued here that German coronals contain both |A| and |I|. Hence /n/ contains |I|. However, forms like [mɔ̃xɛ] <manche> 'many a' are found in CBD, which are not possible in SAG. For that we can say that /n/ in CBD may have to be analyzed differently.

6 Conclusion

The complementary distribution of [ç] and [x] in German is a well known phenomenon and has been described profusely for Standard German. However, the distribution differs throughout the German speech community. In Austria, specifically Standard Austrian German, Central Bavarian, and to some extent Southern Bavarian dialects, the velar fricative [x] is used after vocalized /r/, contrary to Standard German and its related dialects. The vocalization of /r/ to a low offglide [ɐ] is generalized throughout these varieties. Here we see the pluricentric nature of the German language.

Standard Austrian German finds itself in a sandwich position between Standard German influences and its Central Bavarian base. Moreover, diglossia is the norm in Austria. In order to do a phonological analysis, the standard-dialect interaction has to be understood. Thus, sociolinguistic insights are needed, as the concept of German as a pluricentric language is a fairly new one compared to the time span that prescriptive rules had to infiltrate the public's grasp of their own standard and dialects, especially in Austria. This makes the different outcome of the so-called dorsal fricatives after /r/-vocalization in Standard German and Standard Austrian German all the more interesting, as in this case, the Standard German pronunciation was not integrated into Standard Austrian German. Here, an attempt has been made to incorporate correspondences, i.e. input-switch rules into a generative model of dialectal variation.

In Austria there is currently a debate on the political necessity of codifying Standard Austrian German sufficiently. Adequate descriptions and analyses are needed that distinguish not just dialectal influences from a standard, but also one standard from another. Hence this thesis also contributes to the codification of Standard Austrian German.

Caution is necessary, as a codification has to be made in its own right. Standard Austrian German lacks an orthoepic codification which is not just discriminated in some respect from Standard German. Unfortunately, an outdated codification called 'Siebs' is still in use and, more pressing, the few more up to date orthoepic dictionaries are all based on it. It soon becomes clear that one must not rely on data from trained speakers, as these are trained with the aid of a codification that was set down when German was first defined in a unified, monocentric fashion.

The question of what counts as appropriate data for empirical investigations has to be asked more generally. In the previous literature addressing the dorsal fricative distribution, analyses relied on related phenomena that cannot be drawn on equally in every area of the German speech community – like the diminutive <-chen>, which is not a native suffix in large parts of the German speaking area, including the Bavarian as well as the Alemannic parts of Austria. Word-initial written <ch> is a questionable source for phonological analyses as well. Therefore we considered the hypothesis that it might be possible to have different underlying fricatives in different varieties of German. In other words, do we have underlying /x/ in Austria and underlying /ç/ in Germany? As it turned out, underlying /x/ is the more probable in Standard German and its related dialects as well. Since a given phonological framework is designed to predict one surface form and rule out the other, this opposite outcome of the dorsal fricatives, preceded by the same context, is a challenge. The other possibilities are to assume differences in /r/, or the vocalization of /r/. Since the uvular fricative is the most common in SG as well as SAG, i.e. there is no significant difference in the phonetic realizations of /r/ in the two standard languages, the conjecture was explored whether vocalized /r/ in SG is still an underlying rhotic, whilst SAG already has the vocalized allophone underlyingly. This second hypothesis turned out to be unlikely as well. In fact, even though it seems implausible at first glance, it is argued here that underlying phonological differences in the /r/ spawn the opposite outcome of the dorsal fricatives.

To incorporate all this into a phonological framework, an analysis is given in Government Phonology. In GP the theory of melody uses universal, univalent, privative, independently realisable, cognitive entities called elements, and an attempt was made to translate the phonological inventories of SG, SAG and CBD into Element Theory. For the representational component of the analysis, the offspring 'strict CVCV' was chosen. Unfortunately strict CVCV runs into problems concerning a specific phenomenon in CBD: [ɐ] precedes every potentially vocalized /r/, with one exception. In intervocalic position, preceded by a diphthong, the /r/ is articulated without that [ɐ] offglide. Therefore, another GP offspring, called 'VC Phonology', is discussed. Due to the non-branching design of these frameworks, differences between long vowels and monophthongs have to be explained by means of inter-constituent relations.

Remaining questions are numerous. The dialect-standard interaction in diglossic speakers has yet to be understood. For that, it will be necessary to further expose outdated prescriptive standard codes, in order to draw a realistic picture of the varieties used in a specific area, leading to questions on how far these rules penetrate the phonology over what period of time. Psycholinguistic insights on diglossic first language acquisition may contribute greatly as well. Moreover, the phonology of /r/ does not cease to be a 'hot' topic. In CBD, /n/ may have a different underlying ME from that in SG and SAG. Moreover, nasals interfere with isochrony relations in CBD, which may contribute to the discussion in GP whether certain elements are structural manifestations. As for SAG, it is not clear to what extent Bavarian isochrony is still present, which subsequently contributes to a discussion about affricates and their treatment in a given theory. As already mentioned, in GP inter-constituent relations need to be investigated further, not only for vowels, but consonant clusters as well, which in turn would benefit from further investigations of affricates.

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Abstract

In this thesis the following observation is investigated: The realizations of the complementarily distributed fricatives [ç] and [x] differ in the context of a preceding vocalized /r/ throughout the German speech community, leading to surface forms such as [d̥ʊɐç] (<durch>,'through') in Standard German (SG) and [d̥ʊɐx] in Standard Austrian German (SAG). After considering what the terms SG and SAG refer to, the ample previous literature on the fricative distribution is discussed. Thereafter, [x] is assumed underlyingly, which leads us to surmise an underlying difference in /r/. An analysis is given in the non-branching branches of Government Phonology, i.e. CVCV and VC Phonology. On the way, theory-internal issues on how to treat long vowels and diphthongs are touched.

Zusammenfassung

Nach vokalisiertem /r/ unterscheidet sich die Realisierung der komplementär distribuierten dorsalen Frikative [ç] und [x] im Deutschen und Österreichischen Standard, wodurch Formen wie Standard Deutsch [d̥ʊɐç] im Gegensatz zu Österreichischem Standard Deutsch [d̥ʊɐx] <durch> beobachtet werden können. Zuerst wird der Frage nachgegangen, wie *Standard Österreichisches Deutsch* kodifiziert werden kann, vor allem in Hinblick auf die Aussprache. Anschließend wird die reiche Literatur zur Distribution der dorsalen Frikative im Standard Deutschen beleuchtet und die herangezogenen Daten hinterfragt um die zugrundeliegende Form zu bestimmen. Der velare Frikativ [x] wird als zugrundeliegend angenommen, wodurch die Variation durch einen phonologischen Unterschied in /r/ zu erklären sein muss. Zusätzlich wird eine Analyse des Phänomens in zwei Nachfolgetheorien der Rektionsphonologie vorgestellt: CVCV und VC Phonologie. Dabei wird die theorieinterne Frage nach der Handhabung von Langvokalen und Diphthongen berührt.

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