

Topics in German Phonology
Phonology Fest
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Handout 3

1 Opacity in German phonology
1.1 Dorsal Fricative Assimilation

(1) The following examples illustrate that [ç] and [x] can occur word-finally after a vowel. All front vowels (including the diphthongs [ai] and [ɔy]) are found in the (a) context and all back vowels (including the diphthong [au]) are found in the (b) context.

a.	Examples with [ç]:		b.	Examples with [x]:	
	siech	[zi:ç]		Buch	[bu:x]
					‘book’
	mich	[miç]		Spruch	[ʃpʁʊx]
					‘saying’
	Pech	[pɛç]		hoch	[ho:x]
					‘high’
	euch	[ɔyç]		doch	[dɔx]
					‘but’
	Reich	[raiç]		Bach	[bax]
					‘stream’
				nach	[nax]
					‘after’
				Bauch	[baux]
					‘stomach’

Notes:

- The sound transcribed in (1b) and below as [x] surfaces either as velar [x] or uvular [χ]. See Kohler (1990) for discussion.
- Some references on Dorsal Fricative Assimilation include Hall (1989), Noske (1997) and Robinson (2001) (and the references cited therein).

(2) The following examples show the distribution of [ç] and [x] in the context: V __ C # (in a-b) and V __ V (in c-d):

a.	Examples with [ç]:		b.	Examples with [x]:	
	Gicht	[gɪçt]		such-t	[zu:xt]
					‘search (3 sg.)’
	Gerücht	[gɛʀyçt]		Bucht	[buxt]
					‘bay’
	Recht	[ʀɛçt]		Docht	[dɔxt]
					‘wick’
	leicht	[laiçt]		Macht	[maxt]
					‘power’
	feucht	[fɔyçt]			
c.	Examples with [ç]:		d.	Examples with [x]:	
	riech-en	[ri:çən]		such-en	[zu:xən]
					‘search (inf.)’
	Büch-er	[by:çɐ]		mach-en	[maxən]
					‘do (inf.)’
	Becher	[bɛçɐ]		rauch-en	[ʀauxən]
					‘smoke (inf.)’
	Löch-er	[lœçɐ]			

(3) The palatal fricative [ç] occurs in two additional contexts:

a. word-initially:

Chemie	[çemi:]	‘chemistry’
Chirurg	[çirʊrk]	‘surgeon’
Charisma	[çarisma]	‘charisma’

b. after a sonorant consonant:

Dolch	[dolç]	‘dagger’
Mönch	[mœnç]	‘monk’

Note: The [ç] in the examples in (3a) can be pronounced as [k] or [ʃ].

(4) Features assumed here for underlying dorsal consonants (see Hall 1989, Wiese 1996 for similar approaches and Robinson 2001 for a slightly different analysis):

	ç	k	g	ŋ	ʀ
[son]	–	–	–	+	+
[cont]	+	–	–	–	+
[nasal]	–	–	–	+	–
[PLACE]	√	√	√	√	√
[DORS]	√	√	√	√	√
[high]	+	+	+	+	–

(5) Features assumed here for surface dorsal consonants:

	ç	x	k	g	ŋ	ʀ
[son]	–	–	–	–	+	+
[cont]	+	+	–	–	–	+
[nasal]	–	–	–	–	+	–
[PLACE]	√	√	√	√	√	√
[DORS]	√	√	√	√	√	√
[high]	+	+	+	+	+	–
[back]	–	+	+	+	+	+

Notes: The palatal glide [j] has the same features as [i]. The uvular fricative [χ] (recall the note after 1) is [+back, –high]

(6) Features for vowels

	i	e	u	o
[DORS]	√	√	√	v
[back]	–	–	+	+
[high]	+	–	+	–

- (7) In some of the works cited above /ç/ is argued to be underlyingly unspecified for [back]. Dorsal Fricative Assimilation spreads both values of this feature (see the linear version of the rule in a).

The default rule in (b) (ordered after Dorsal Fricative Assimilation by the Elsewhere Condition) says that all remaining dorsal fricatives are [-back]:

- a. Dorsal Fricative Assimilation (DFA):

[-son, +cont, DORS] → [αback] / [-cons, αback] ____

- b. Default Rule:

[-son, +cont, DORS] → [-back]

- (8) Derivations of four representative words (in which /X/ is a dorsal fricative underspecified for [back]):

	<i>mich</i>	<i>Buch</i>	<i>Chemie</i>	<i>Dolch</i>
	/m I X/	/b u: X/	/X e m i:/	/d ɔ l X/
1. DFA	m I ç	b u: x	-----	-----
2. Default	-----	----	ç e m i:	d ɔ l ç
	[mɪç]	[bu:x]	[çemi:]	[dɔlç]

Note: An OT treatment is presented in section 1.2.2.

- (9) Opaque examples in which [ç] occurs after a back vowel:

- a. Across a compound boundary:

Biochemie	[bi:ɔçemi:]	‘biochemistry’
Indo-China	[ɪndoçi:na]	‘Indo-China’

- b. Before the diminutive suffix *-chen*:

Autochen	[autoçən]	‘car (dim.)’
Omachen	[o:maçən]	‘grandmother (dim.)’

- (10) A prosodic solution: Each part of a compound is a phonological word, as is *-chen* (see Wiese 1996, Noske 1997). Thus, DFA applies only when the fricative and preceding vowel belong to the same phonological word.

Problem: *-chen* would be the only phonological word of German in which the only vowel is schwa.

1.2 r-Vocalization

(11) The consonantal r-sound of German (i.e. the uvular sound [ʀ]) surfaces in onset position:

- a. word-initial:
- | | | |
|---------|----------|-----------|
| rot | [ʀo:t] | ‘red’ |
| richtig | [ʀiçtɪç] | ‘correct’ |
| roh | [ʀo:] | ‘raw’ |
- b. word-internally in syllable-initial position:
- | | | |
|----------|------------|----------|
| fahr-en | [fa:.ʀən] | ‘travel’ |
| Ehre | [e:.ʀə] | ‘honor’ |
| sperr-en | [ʃpɛ:.ʀən] | ‘block’ |
- c. after a consonant in a syllable onset:
- | | | |
|----------|-----------|--------|
| krank | [kʀaŋk] | ‘sick’ |
| Prüf-ung | [pʀy:fʊŋ] | ‘test’ |
| treten | [tʀe:tən] | ‘kick’ |

(12) The *r* in the examples in (11) is uvular in Standard German. In other varieties of German [e.g. in many Southern dialects] *r* is alveolar.

While the alveolar *r* referred to above is assumed to always be a trill, the uvular *r* of Standard German can have three different manners of articulation: (a) trill, (b) fricative, or (c) central approximant:

<i>Description</i>	<i>symbol</i>
a. uvular trill:	[ʀ]
b. voiced uvular fricative:	[ʁ]
c. uvular central approximant:	[ʀ̥]
d. alveolar trill:	[r]

(13) The following examples illustrate that the consonantal [ʀ] alternates with the mid-lower-central vowel [ɤ]. For reasons to be made clear below the latter sound is referred to in the literature as the ‘vocalized-r’. The examples in (a-c) show that the vocalized-r occurs in coda position.

- a.
- | | | | | | |
|------|--------|----------|---------|-----------|-------------------|
| Tier | [ti:ɤ] | ‘animal’ | Tier-e | [ti:.ʀə] | ‘animals’ |
| Rohr | [ʀo:ɤ] | ‘pipe’ | Rohr-e | [ʀo:.ʀə] | ‘pipes’ |
| Jahr | [ja:ɤ] | ‘year’ | Jahr-es | [jɐ:.ʀəs] | ‘year (gen. sg.)’ |
- b.
- | | | | | | |
|-----------|--------------|--------------|---------|------------|-----------------|
| Lehr-ling | [le:ɤ.lɪŋ] | ‘apprentice’ | lehr-e | [le:.ʀə] | ‘teach (2 sg.)’ |
| spar-sam | [ʃpa:ɤ.za:m] | ‘frugal’ | spar-en | [ʃpa:.ʀən] | ‘save (inf.)’ |
- c.
- | | | | | | |
|---------|----------|-----------------|--------|----------|-----------------|
| lehr-t | [le:ɤt] | ‘teach (3 sg.)’ | lehr-e | [le:.ʀə] | ‘teach (1 sg.)’ |
| lehr-st | [le:ɤst] | ‘teach (2 sg.)’ | | | |

- (14) The following examples are words with a vocalized-r which does not alternate with the consonantal [ʀ]. It is usually assumed in the literature that the vocalized-r in words like these is underlyingly /ʀ/ because [ʀ] and [ɐ] are considered to be allophones.

a.	er	/e:ʀ/	[e:ɐ]	‘he’
b.	sehr	/ze:ʀ/	[ze:ɐ]	‘very’

- (15) If [ʀ] and [ɐ] differ featurally only in terms of [consonantal] (see Hall 1993, Wiese 1996) then the following rule of r-Vocalization can be posited:

$$\begin{array}{c} \text{Rhyme} \\ | \\ /ʀ/ \rightarrow [-\text{consonantal}] / \quad \underline{\quad} \end{array}$$

Notes: For the literature on r-Vocalization see Hall (1993) and references cited therein.

- (16) The vowel preceding the /ʀ/ in the examples in (13) is long. After a short vowel [ʀ] optionally surfaces as [ɐ] in Standard German:

Herr	[hɛʀ]/[hɛʀ]	‘Mr.’	Herr-en	[hɛ.ʀən]	‘Mr. (pl.)’
Narr	[naʀ]/[naʀ]	‘fool’	Narr-en	[na.ʀən]	‘fools’

These data require that the rule of r-Vocalization in (15) include a statement to the effect that it applies only optionally after a short vowel.

- (17) In the following words we can observe that r-Vocalization produces the allophone [ɐ] before the palatal fricative [ç]. Examples like these show that Dorsal Fricative Assimilation is opaque. More precisely, this is a case of underapplication.

a.	durch	[dʊʌç]	‘through’
	Furcht	[fʊʌçt]	‘fear’
	Storch	[ʃtʌç]	‘stork’
b.	Arche	[aʌçə]	‘arch’

1.2.1 A rule-based account

(18) Derivations (from Standard German) illustrating the interaction of Dorsal Fricative Assimilation and r-Vocalization (see Hall 1993). Note the counterfeeding order.

	/t i: ʀ/	/t i: ʀ - ə/	/d u ʀ ç/
1. Syllabification	.t i: ʀ.	.t i: .ʀ ə.	.d u ʀ ç.
2. Dorsal Fricative Assimilation	-----	-----	-----
3. r-Vocalization	.t i: ʁ.	-----	.d u ʁ ç.
	[.t i: ʁ.]	[.t i: .ʀə.]	[.d u ʁ ç.]

(19) Derivations with the reversed rule ordering:

	/t i: ʀ/	/t i: ʀ - ə/	/d u ʀ ç/
1. Syllabification	.t i: ʀ.	.t i: .ʀ ə.	.d u ʀ ç.
2. r-Vocalization	.t i: ʁ.	-----	.d u ʁ ç.
3. Dorsal Fricative Assimilation	-----	-----	.d u ʁ x.
	[.t i: ʁ.]	[.t i: .ʀə.]	* [.d u ʁ x.]

1.2.2 An OT alternative

(20) Constraints for r-Vocalization (Ito & Mester 2001):

- a. *CODA-R : No coda [ʀ]
- b. *ʁ: No ʁ
- c. IDENT (cons) : Input and output agree in [consonantal]

- (21) r-Vocalization requires ranking *CODA-R » *ɤ » IDENT (cons). The correct output forms are selected if /r/ or /ɐ/ is in the input. Here the examples are *Tier* ‘animal’ and *Tiere* ‘animals’.

	/t i: r/	*CODA-R	*ɤ	IDENT (cons)
a.	[t i: r]	*!		
b.	→ [t i: ɤ]		*	*

	/t i: r- ə/	*CODA-R	*ɤ	IDENT (cons)
c.	→ [t i: .R ə]			
d.	[t i: .ɤ ə]		*!	*

- (22) Constraints to account for Dorsal Fricative Assimilation (Ito & Mester 2001):

- *x: No [x]
- *ç: No [ç]
- IDENT (back) : Input and output agree in [back]
- VEL: * ç / [-cons, +back] ____ ([-cons, +back] must not be followed by [ç])

- (23) The following examples show that the input segment is not important. Here the example is *solch* ‘such’.

	/zɔlç/	*x	*ç	IDENT (back)
a.	[zɔlx]	*!		*
b.	→ [zɔlç]		*	

	/zɔlx/	*x	*ç	IDENT (back)
c.	[zɔlx]	*!		
d.	→ [zɔlç]		*	*

- (24) The constraint VEL is required to account for the distribution of [ç] and [x] after vowels. Here the example is *Buch* ‘book’.

	/bu:ç/	VEL	*x	*ç	IDENT (back)
a.	→ [bu:x]		*		*
b.	[bu:ç]	*!		*	

	/bu:x/	VEL	*x	*ç	IDENT (back)
c.	→ [bu:x]		*		
d.	[bu:ç]	*!		*	*

- (25) How does the preceding analysis cope with the opaque examples in (17), e.g. [dʊɐç] ‘through’? A possible analysis (see Ito & Mester 2001: 271) fails:

	/dʊɐç/	*CODA-R	VEL	*ɐ	*x	IDENT (cons)	IDENT (back)
a.	← [dʊɐç]	*!					
b.	[dʊɐç]		*!	*		*	
c.	[dʊɐx]	*!			*		*
d.	[dʊɐx]			*	*	*	*

- (26) The solution (according to Ito & Mester 2001): Draw a distinction between a lexical and postlexical level.

a. Properties of Dorsal Fricative Assimilation:

- i. Sensitive to morphological structure (e.g. *tau[x]-en* ‘to dive’ vs. *Tau-[ç]en* ‘rope’ (dim)’)
 - ii. [ç] and [x] are acoustically and articulatorily far separated; we are not dealing with a gradient, co-articulatory effect
 - iii. The alternation is never optional

b. Properties of r-Vocalization:

- i. Not sensitive to morphological structure
- ii. [ç] is subject to an extensive degree of variation...as is typical of processes that are under detailed phonetic control
- iii. The alternation is partially optional

- (27) Two rankings for two different components (Ito & Mester 2001: 273ff.):

a. Lexical rankings:

- i. For r-ɐ: *ɐ » *CODA-R » *R » IDENT (cons)
- ii For ç-x: VEL » *x » *ç » IDENT (back)

b. Postlexical rankings:

- i. For r-ɐ: *CODA-R » *ɐ » *R » IDENT (cons)
- ii For ç-x: IDENT (back) » VEL » *x » *ç

(28) Lexical:

		* p	*CODA-R	* R	ID (cons)	VEL	* x	* ç	IDENT (back)
a.	/dʊʀç/								
b.	/dʊʀx/								
c.	/dʊʁç/								
d.	/dʊʁx/								
a.	→ [dʊʀç]		*	*	* c,d			*	* b,d
b.	[dʊʁç]	*!			* a,b	*		*	* b,d
c.	[dʊʀx]		*	*	* c,d		*!		* a,c
d.	[dʊʁx]	*!			* a,b		*		* a,c

(29) Postlexical:

	/dʊʀç/	*CODA-R	* p	* R	ID (cons)	IDENT (back)	VEL	* x	* ç
a.	[dʊʀç]	*!		*					*
b.	→ [dʊʁç]		*		*		*		*
c.	[dʊʀx]	*!		*		*		*	
d.	[dʊʁx]		*		*	*!		*	

1.2.3 A ‘phonetically based’ alternative

(30) The palatal fricative [ç] after /n l/ (recall 3a) and /R/ (recall 17):

- a. Dolch [dolç] ‘dagger’
Mönch [mœnç] ‘monk’
- b. durch [dʊʁç] ‘through’

(31) Robinson (2001) argues that the environment /n l R/ is a natural environment for Dorsal Fricative Assimilation because these three consonants show a palatalizing influence on consonants in German dialects and in the history of German.

(32) What about the vocalization of /R/ in (30b)? According to Robinson this makes sense given Ulbrich’s (1972) phonetic study of German /r/: Ulbrich showed that the [ɐ] in pre-[ç] contexts is further front than other [ɐ]’s in the sense that it tends toward [ə] or the front vowel [ɪ]. Implied narrow transcriptions of two representative examples:

- a. Narr [næ] ‘fool’ [ɐ] = ‘central’ vowel
- b. durch [dʊʁç] ‘through’ [ɐ] = ‘front’ vowel

Note: Green (2005: 16, note 3) also hypothesizes that the vocalized-r in (30b) is more front than it is in non-[ç] contexts. He implies that German examples like *durch* are not really opaque.

(33) Maybe the approach rejected by Ito & Mester (2001) in (25) works after all:

	/dʊrç/	*CODA-R	VEL	*ɸ	*x	IDENT (cons)	IDENT (back)
a.	[dʊrç]	*!					
b.	[dʊɐ̯ç]		*!	*		*	
c.	[dʊrç]	*!					
c.	→ [dʊɐ̯ç]					*	
c.	[dʊrx]	*!			*		*
c.	[dʊɐ̯x]		*!		*	*	*

Note: Robinson does not have this tableau in his analysis.

1.3 g-Spirantization

(34) The following examples illustrate alternations between [g] and [k] in Standard German. These examples show that /g/ (like all voiced obstruents) undergoes Final Devoicing. The segment before /g/ is a vowel (in a) or a consonant (in b).

a.	genug	[gənu:k]	‘enough’	genüg-en	[gəny:gən]	‘suffice’
	log	[lo:k]	‘lied’	log-en	[lo:gən]	‘lied (1 pl.)’
	Tag	[ta:k]	‘day’	Tag-e	[ta:gə]	‘days’
	Sieg	[zi:k]	‘victory’	sieg-en	[zi:gən]	‘be victorious’
	lüg	[ly:k]	‘lie (imp.)’	lüg-en	[ly:gən]	‘lie (1 pl.)’
	Weg	[ve:k]	‘path’	Weg-e	[ve:gə]	‘paths’
	Zweig	[tsvaik]	‘branch’	Zweig-e	[tsvaigə]	‘branches’
b.	Talg	[talk]	‘tallow’	Talg-e	[talgə]	‘tallow (dat.)’
	Berg	[bɛrk]	‘mountain’	Berg-e	[bɛrgə]	‘mountains’

(35) In the following words [g] alternates with [ç]. The rule that accounts for this alternation is traditionally referred to as g-Spirantization. In Standard German /g/ spirantizes in coda position after the vowel /ɪ/. In all of the examples below this vowel is unstressed because there are no examples with a stressed /ɪ/ followed by a coda /g/.

a.	König	[kø:nɪç]	‘king’	König-e	[kø:nɪgə]	‘kings’
	fertig	[fɛrtɪç]	‘ready’	fertig-e	[fɛrtɪgə]	‘ready (adj. end.)’
	wenig	[ve:nɪç]	‘few’	wenig-er	[ve:nɪgɐ]	‘fewer’
	ruhig	[ru:ɪç]	‘quiet’	ruhig-es	[ru:ɪgəs]	‘quiet (adj. end.)’

b. reinig-t	[ʀainɪçt]	‘to clean (3 sg.)’	reinig-en	[ʀainɪçə]	‘to lean (inf.)’
reinig-st	[ʀainɪçst]	‘to clean (2 sg.)’			
ruhig	[ʀu:ɪç]	‘quiet’	beruhig-en	[bəʀu:ɪçən]	‘to calm (inf.)’
beruhig-t	[bəʀu:ɪçt]	‘to calm (3 sg.)’			
beruhig-st	[bəʀu:ɪçst]	‘to calm (2 sg.)’			

Notes:

- For literature on g-Spirantization see Hall (1989) and Robinson (2001).
- Due to the gap discussed in section 1 of Handout 1, there are very few examples like the ones in (35) in which some other short vowel (i.e. /ʏ ʊ ə/) precedes the /g/. One recent loan word with /ɔg/ is *einloggen* ‘to log in’, vgl. *ein-log-t* [kt] ‘to log in (3 sg.)’.

(36) The following words show that coda /k/ after /ɪ/ surfaces as [k]:

dick	[dɪk]	‘fat’
Plastik	[plastɪk]	‘plastic’
Tragik	[tra:gɪk]	‘tragedy’
Logik	[lo:gɪk]	‘logic’
Keramik	[keramɪk]	‘ceramic’
Technik	[tɛçnɪk]	‘technique’
Klinik	[kli:nɪk]	‘clinic’

(37) Underlying /ç/ does not alternate with [g]:

Teppich	[tɛpɪç]	‘carpet’	Teppich-e	[tɛpɪçə]	‘carpets’
Kranich	[kra:nɪç]	‘crane’	Kranich-e	[kra:nɪçə]	‘cranes’

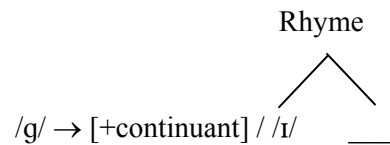
(38) In Standard German g-Spirantization is systematically blocked before a suffix that contains [ç] (in a) or the second part of a compound that contains this segment (in b):

a. könig-lich	[kø:nɪkɪç]	‘kingly, royal’
b. König-reich	[kø:nɪkraɪç]	‘kingdom’

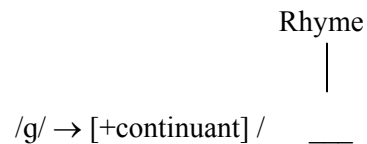
(39) In Colloquial Northern German (Wiese 1996; Ito & Mester 2003) any coda /g/ will spirantize, regardless of the segment that precedes. The examples in (a-d) below are representative of (34) and (35). Note that the spirantized /g/ can surface as [ç] or [x].

a.	genug	[gənu:x]	‘enough’	genüg-en	[gəny:gən]	‘suffice’
	Tag	[ta:x]	‘day’	Tag-e	[ta:gə]	‘days’
	Zweig	[tsvaiç]	‘branch’	Zweig-e	[tsvaigə]	‘branches’
b.	Talg	[talç]	‘tallow’	Talg-e	[talgə]	‘tallow (dat.)’
	Berg	[bɛRç]	‘mountain’	Berg-e	[bɛRgə]	‘mountains’
c.	König	[kø:nɪç]	‘king’	König-e	[kø:nɪgə]	‘kings’
	fertig	[fɛrtɪç]	‘ready’	fertig-e	[fɛrtɪgə]	‘ready (adj. end.)’
d.	reinig-t	[rainɪçt]	‘to clean (3 sg.)’	reinig-en	[rainɪgə]	‘to lean (inf.)’
	reinig-st	[rainɪçst]	‘to clean (2 sg.)’			

(40) a. g-Spirantization rule for Standard German:



b. g-Spirantization rule for Northern Colloquial German (after Wiese 1996):



1.3.1 A rule-based treatment

(41) Derivations (from Standard German) illustrating the interaction of Final Devoicing and g-Spirantization (see Hall 1989). Note that the latter rule counterbleeds the former.

	<i>König</i> /k ø: n ɪ g/	<i>Könige</i> /k ø: n ɪ g - ə/	<i>Tag</i> /ta:g/	<i>Logik</i> /lo:gɪk/	<i>Buch</i> /bu:ç/
1. Syllabification	.k ø: .n ɪ g.	.k ø: .n ɪ .g ə.	.t a: g.	.lo: gɪk.	.b u: ç.
2. g-Spirantization	.k ø: .n ɪ ɣ.	-----	----	-----	-----
3. Final Devoicing	.k ø: .n ɪ x.	-----	.t a: k.	-----	-----
4. Dorsal Fricative Assimilation	.k ø: .n ɪ ç.	-----	----	-----	b u: x
	[.kø:.nɪç.]	[.kø:.nɪ.gə.]	[.ta:k.]	[.l o: g ɪ k.]	[.b u: x.]

1.3.2 An OT treatment

(42) Ito & Mester (2003) posit the following constraints:

- a. *VC: *VOICObs & *COD (penalizes voiced obstruents in coda)
 - b. *CD: *COD & *DORSPLoS (penalizes [g] and [k] in the coda)
 - c. MAX: No deletion
 - d. IDENT (cont): Input and output agree in the feature [continuant]
 - e. IDENT (voice): Input and output agree in the feature [voice]
- (43) It is possible to account for the spirantization of /g/ to [ç] (see first tableau) but the problem is how to block spirantization from affecting /k/ as well (see second tableau). The intended winner in the second tableau is (i), but the incorrect winner in (j) is selected.

	/ho:nɪg/	*VC	*CD	MAX	IDENT (cont)	IDENT (voic)
a.	[ho:nɪg]	*!	*			
b.	[ho:nɪɣ]	*!			*	
c.	[ho:nɪ]			*!		
d.	[ho:nɪk]		*!			*
e.	→ [ho:nɪç]				*	*

	/plastık/	*VC	*CD	MAX	IDENT (cont)	IDENT (voic)
f.	[plastıg]	*!	*			
g.	[plastrı]	*!			*	
h.	[plastı]			*!		
i.	[plastık]		*!			*
j.	!! → [plastıç]				*	*

- (44) If the markedness constraint *CD is locally conjoined with the faithfulness constraint IDENT (voic) then the analysis says that only a *derived* /k/ triggers spirantization. The derived /k/ is the one in the first tableau. The second one contains an underived /k/:

	/ho:nıg/	*VC	*CD & IDENT (voic)	MAX	IDENT (cont)	*CD	IDENT (voic)
a.	[ho:nıg]	*!				*	
b.	[ho:nrı]	*!			*		
c.	[ho:nı]			*!			
d.	[ho:nık]		*!			*	*
e.	→ [ho:nıç]				*		*

	/plastık/	*VC	*CD & IDENT (voic)	MAX	IDENT (cont)	*CD	IDENT (voic)
f.	[plastıg]	*!				*	*
g.	[plastrı]	*!			*		*
h.	[plastı]			*!			
i.	→ [plastık]					*	
j.	[plastıç]				*!		

1.3.3 A stratal OT treatment

- (45) Recall from handout 2 that the following rankings were proposed to deal with the distribution of the velar nasal:

- Lexical: *VC, MAX-C, DEP-C » IDENT-vc
- Postlexical: IDENT-vc, MAX-C, DEP-C » *VC

(46) Two tableaux for the example *Hund* ‘dog’:

Lexical:

/hund/	IDENT-VC	MAX-C	DEP-C	*VC
a. → [hund]				*
b. [hʊn]		*!		
c. [hʊnt]	*!			
d. [hʊn.dV]			*!	

Postlexical:

/hund/	*VC	MAX-C	DEP-C	IDENT-VC
a. [hund]	*!			
b. [hʊn]		*!		
c. [hʊn.dV]			*!	
d. → [hʊnt]				*

(47) Spirantization of (all) coda stops would require that the general markedness constraint in (a) be ranked over the faithfulness constraint in (c). g-Spirantization in Colloquial Northern German requires that the specific markedness constraint penalizing a coda dorsal voiced stop in (b) be ranked over the same faithfulness constraint. (It is not clear how to capture Standard German, other than with brute force, e.g. * $ig]_{\sigma}$).

a. * $[-son, -cont]]_{\sigma}$: No coda stops

b. * $g]_{\sigma}$: No coda voiced dorsal stops

c. IDENT (cont) : Input and output agree in continuancy

If g-Spirantization is lexical, then (b) is ranked over (c) in that component.

(48) Lexical rankings:

/ho:nɪg/	IDENT-VC	MAX-C	*VC	*V g] _σ	IDENT (cont)
a. [ho:nɪg]			*	*!	
b. → [ho:nɪŋ]			*		*
c. [ho:nɪ]		*!			
d. [ho:nɪk]	*!				
d. [ho:nɪç]	*!				*

/plastɪk/	IDENT-VC	MAX-C	*VC	*V g] _σ	IDENT (cont)
a. [plastɪg]	*!		*	*	
b. [plastɪŋ]	*!		*		*
c. [plastɪ]		*!			
d. → [plastɪk]					
d. [plastɪç]					*!

(49) Postlexical rankings:

/ho:nɪŋ/	*VC	MAX-C	IDENT-VC	*V g] _σ	IDENT (cont)
a. [ho:nɪg]	*!			*	*
b. [ho:nɪŋ]	*!				
c. [ho:nɪ]		*!			
d. [ho:nɪk]			*		*!
d. → [ho:nɪç]			*		

/plastɪk/	*VC	MAX-C	IDENT-VC	*V g] _σ	IDENT (cont)
a. [plastɪg]	*!		*	*	
b. [plastɪŋ]	*!		*		*
c. [plastɪ]		*!			
d. → [plastɪk]					
d. [plastɪç]					*!

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