

Handout #8

Neutralization

German obstruents ([-son])

	[+lab, - cor, -back]	[-lab, +cor, -back]	[-lab, -cor, +back]
[-cont, -delrel]	p, b	t, d	k, g
[-cont, +delrel]	pf	ts, tʃ	
[+cont, +delrel]	f, v	s, z, ʃ, ʒ, ç	x

German

- German has voiced and voiceless obstruents, which are in contrastive distribution:

– taobə “dove” (*Taube*)

daobə “stave” (*Daube*)

– laetən “to lead” (*leiten*)

laedən “to suffer” (*leiden*)

– buntə “colorful (f.sg.)” (*bunte*)

bundə “associations” (*Bunde*)

German

- However, at the end of a syllable, only voiceless obstruents occur.
- There are words ending in voiceless obstruents.
 - laup “leaf” (*Laub*)
 - lit “song” (*Lied*)
 - lik “lie!” (*lieg*)
- But there are no words ending in voiced obstruents.

German (Wiese 1996)

- This restriction leads to alternations (Period marks a syllable boundary):
 - Rat “wheel” (*Rad*)
 Ra.**d**əs “wheel’s” (*Rades*)
 - bunt “association” (*Bund*)
 bun.**d**ə “associations” (*Bunde*)
 - lop “praise” (*Lob*)
 lo.**b**əs “of praise” (*Lobes*)

German

- ak.tif “active” (*aktiv*)
- ak.ti.və “active (f.sg.)” (*aktive*)
- gras “grass”
- gra.zən “graze, cut grass”
- ja:k.tən “hunts (noun)”
- ja:gən “hunt (verb)”
- re.gən “rain (noun)”
- rek.nən “rain (verb)”

German

- The morpheme alternants in these examples are the following:
 - Rat ~ Rad, bunt ~ bund, lop ~ lob, aktiv ~ aktiv, gras ~ graz, ja:k ~ ja:g, Regən ~ Rekn
- The alternant with the final voiceless obstruent (e.g. Rat) occurs only before a consonant or a pause.
- The alternant with the final voiced obstruent (e.g. Rad) occurs only elsewhere.

German

- Other morphemes have nonalternating voiceless obstruents.
 - Rat “advice” (*Rat*)
 - Ra.təs “of advice” (*Rates*)
 - bunt “colorful” (*bunt*)
 - bun.tə “colorful (fem.)” (*bunte*)
- There are no morphemes with nonalternating voiced obstruents.

German

- The distribution of voiced and voiceless obstruents in German is as follows:
 - Voiced obstruents do not occur at the end of a syllable, but do occur elsewhere.
 - Voiceless obstruents occur at the end of a syllable, as well as elsewhere.
- This is not a complementary distribution, since the two classes have overlapping distribution.

Neutralization

- This is a **neutralization** distribution.
- Two classes of sounds are in neutralization distribution if they are in contrastive distribution, but there is a context where one class can occur and the other can't occur.
- The class that can't occur in that context is the **restricted class** (e.g. voiced obstruents in German)
- The other class is the **unrestricted** one (e.g. voiceless obstruents in German)

Analysis of neutralization

- If two sounds are in neutralization distribution, they must belong to different phonemes, since they are in contrastive distribution.
- But there is a restriction on distribution, so there must also be a rule that affects one of the two sounds without affecting the other.
- The rule changes the restricted class to the unrestricted one in the context where the restricted class is disallowed.

Analysis of the German pattern

- Both voiced and voiceless obstruents must be included among the phonemes:
 - /p, t, k, b, d, g, ts, tʃ, f, v, s, z, ʃ, ʒ, ç/
- There is a rule (which we will call **Final devoicing**) neutralizing the contrast:
 - [-son] --> [-voice]/ ____ .
- This rule changes the restricted class of voiced obstruents to the unrestricted class of voiceless ones at the end of a syllable.

Analysis of the German pattern

- The alternating morphemes are ones that end in the restricted class (voiced obstruents) in their underlying form.
 - / Rad, bund, lob, aktiv, gRaz, ja:g /
- The nonalternating morphemes are ones ending in the unrestricted class (voiceless obstruents) in their underlying form.
 - / Rat, bunt /

Derivation

Underlying representation	/Rad/	/Rad-əs /	/Rat/	/Rat-əs /
Final devoicing	/Rat/	_____	_____	_____
Surface representation	[Rat] <i>(Rad)</i>	[Radəs] <i>(Rades)</i>	[Rat] <i>(Rat)</i>	[Ratəs] <i>(Rates)</i>

English obstruents ([-son])

	[+lab, - cor, -back]	[-lab, +cor, -back]	[-lab, -cor, +back]
[-cont, -delrel]	p, b	t, d	k, g
[-cont, +delrel]		tʃ, dʒ	
[+cont, +delrel]	f, v	θ, ð, s, z, ʃ, ʒ	

English

- There is a contrast between voiced and voiceless obstruents:

– sæp (<i>sap</i>)	-	zæp (<i>zap</i>)
– t ^h u (<i>too, two</i>)	-	du (<i>due</i>)
– beɪs (<i>base</i>)	-	beɪz (<i>bays</i>)
– bɛt ^ɹ (<i>bet</i>)	-	bɛd ^ɹ (<i>bed</i>)

English

- Both voiced and voiceless obstruents occur at the end of a word after a voiced sound:
 - bɛlt^ʔ (*belt*) bɛld^ʔ (*belled*)
 - p^hɪls (*pulse*) p^hɪlz (*pulls*)
 - baɪt^ʔ (*Bart*) baɪd^ʔ (*bard*)
 - k^hɔɪs (*coarse*) k^hɔɪz (*cores*)

English

- Both voiced and voiceless obstruents occur at the word-medially after a voiceless sound:
 - æfgæn (*Afghan*)
 - næp^ʔk^hɪn (*napkin*)
 - k^hæt^ʔb_ɪd^ʔ (*catbird*)
 - k^hæt^ʔt^heɪl (*cattail*)

English

- But at the end of a word after a voiceless sound, only the voiceless obstruents occur:
 - $k^h \downarrow \Lambda k^?s$ (*crux*) is possible, but no word ends with $*kz\#$.
 - $\text{æp}^?s$ (*apse*) is possible, but no word ends with $*pz\#$
 - $\text{æk}^?t^? \text{ (act)}$, $\text{læft}^? \text{ (loft)}$, $k^h \text{ast}^? \text{ (cost)}$ are possible, but not $*kd\#$, $*fd\#$, or $*sd\#$.

English

- This restriction leads to alternations in various inflectional morphemes:
 - The plural marker *-(e)s*:

bæk ^ɪ s (<i>backs</i>)	bægz (<i>bags</i>)
dʌ fs (<i>duffs</i>)	dʌ vz (<i>doves</i>)
 - The genitive marker or verbal contraction *'s*:

dɪk ^ɪ s (<i>Dick's</i>)	dʌ gz (<i>Doug's</i>)
k ^h æt ^ɪ s (<i>cat's</i>)	dəgz (<i>dog's</i>)

English

- The past tense marker *-ed*:

bæk^ˈt^ˈ (*backed*) bæɡ^ˈd^ˈ (*bagged*)

k^haft^ˈ (*coughed*) lʌ vɪd^ˈ (*loved*)

- The perfect marker *-ed*:

lʌ mp^ˈt^ˈ (*lumped*) ɪʌ b^ˈd^ˈ (*rubbed*)

Alternation

- The alternations are $-s \sim -z$ and $-t^{\text{ʔ}} \sim -d^{\text{ʔ}}$.
- The alternants with the voiceless obstruents occur only word-finally after a voiceless sound, and the other alternants occur only elsewhere.
- More generally:
 - Voiced obstruents do not occur at the end of a word after a voiceless consonant, but do occur elsewhere (*Restricted*).
 - Voiceless obstruents occur there, as well as elsewhere (*Unrestricted*).

Analysis

- Both voiced and voiceless obstruents must be included among the phonemes:
 - /p, t, k, b, d, g, tʃ, dʒ, f, v, θ, ð, s, z, ʃ, ʒ/
- Rule (**Final devoicing**):
 - [-son] --> [-voice] / [-voice] ____ #
- The underlying representation of the alternating morphemes must be the ones with restricted sounds (the voiced obstruents).
 - /-z, -d/

Derivations

Underlying representation	/læf - z/	/l Λ v - z/
Final devoicing	/læfs/	—
Surface representation	[læfs]	[l Λ vZ]

Complementary and neutralization distribution

- Both complementary and neutralization distribution involve two sets of sounds - one restricted and one unrestricted.
- The restricted class of sounds in a complementary distribution does not occur anywhere except one position.
- For the restricted class in a neutralization distribution, there is just one position where it does not occur.

Complementary and neutralization distribution

- The unrestricted class of sounds in a complementary distribution is subject to one restriction - it can't occur in the context that the restricted sounds occur in.
- So in a complementary distribution the unrestricted class is less restricted than the restricted class - it occurs in a broader range of contexts.
- In a neutralization distribution the unrestricted class is truly unrestricted.

Complementary and neutralization distribution

- In either kind of distribution, a phonological rule expresses the restriction, by changing a class of sounds that doesn't occur in a context into the class that does occur there.
- In a complementary distribution, the change is from the unrestricted class (the default) to the restricted class.
- In a neutralization distribution, the change is from the restricted class to the unrestricted.

References

- Wiese, R. (1996). *The Phonology of German*. Oxford University Press, Oxford.