

Modern Standard Danish stop gradation explained diachronically

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Introduction

Danish has six stop phonemes

- /b d g p t k/

In simple onset position,

- /b d g/ are voiceless /p t k/
- /p t k/ are aspirated [p^h t^h k^h]

Syllable-finally or before schwa,

- /p t k/ deaspirate
- /b d g/ alternate with glides or zero

Traditional analysis

UF	Strong	Weak
/p/	[p ^h]	[p]
/t/	[t ^h]	[t]
/k/	[k ^h]	[k]
/b/	[p]	[p ~ ʊ]
/d/	[t]	[ʔ]
/g/	[k]	[k ~ ʊ ~ ɪ ~ Ø]
/v/	[v]	[ʊ]
/j/	[j]	[ɪ]

Rampant neutralization of /b g v j/ in weak position.

- Often not resolveable
- /g/ is especially problematic!

Lines of evidence

Irregular verbalizer *-ere* [-^he:^hʔ]

<i>galop</i>	[kæ ^h lɔp]	‘gallop’ (n.)
<i>galopere</i>	[kæ ^h lɔ ^h p ^h e: ^h ʔ]	‘to gallop’
<i>lak</i>	[^h lɔk]	‘lacquer (n.)’
<i>lakere</i>	[lɔ ^h k ^h e: ^h ʔ]	‘to lacquer’

Derivational suffixes like *-ik* [-^hik]

<i>metode</i>	[me ^h t ^h o: ^h ʔ]	‘method’
<i>metodik</i>	[met ^h o ^h tik]	‘methodics’

Irregular past tense *-te* [-tə]

<i>smage</i>	[^h smæ: ^h ɪ]	‘to taste’
<i>smagte</i>	[^h smaktə]	‘tasted’
<i>koge</i>	[^h k ^h o: ^h ʊ]	‘to boil’
<i>kogte</i>	[^h k ^h ɔktə]	‘boiled’

Evolutionary Phonology

- Phonological phenomena are often grounded in common, well-understood sound changes
- Synchronic OR diachronic explanation is enough

Typology of changes

- **Change** (perceptual similarity → misperception)
- **Chance** (phonologically ambiguous signal)
- **Choice** (variation → recategorization)

Danish ~1700: Step 1

Closure voicing is difficult, especially syllable-finally

- Weak /b d g/ spirantize to retain laryngeal contrast

UF	Strong	Weak
/p/	[p]	[p]
/t/	[t]	[t]
/k/	[k]	[k]
/b/	[b]	[β]
/d/	[d]	[ð]
/g/	[g]	[ɣ]

Danish ~1700: Step 2

More loss of closure voicing.

In strong position,

- Voicing contrast → aspiration contrast

UF	Strong	Weak
/p/	[p ^h]	[p]
/t/	[t ^h]	[t]
/k/	[k ^h]	[k]
/b/	[p]	[β]
/d/	[t]	[ð]
/g/	[k]	[ɣ]

Danish ~1850

Loss of all obstruent voicing

- Some varieties went for fricative devoicing

UF	Strong	Weak
/p/	[p ^h]	[p]
/t/	[t ^h]	[t]
/k/	[k ^h]	[k]
/b/	[p]	[β]
/d/	[t]	[ð]
/g/	[k]	[ɣ]

Recategorization

Speaker → Prod. → Perc. → Listener

- /b/ → [β] → [ʊ] → /v/
- /g/ → [ɣ] → [ʊ] → /v/
- /g/ → [ɣ] → [ɪ] → /j/
- /g/ → [ɣ] → Ø → nothing

Change as glides and semivowels are inherently similar

Chance as the signal is then phonologically ambiguous

- [ʊ ɪ] were already existing allophones of /v j/

Synchronically, the alternations are suppletive

- The **diachronic** result of pressure against obs. voicing