

Predicting the result of vowel transfer

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1 Introduction

The idea for this study came from two readers' letters to the Danish newspaper *Politiken*, complaining about the poor attempts by several television announcers at pronouncing *Dogville* (the title of a film by Danish director Lars von Trier). One reader claimed the pronunciation would be perceived by English native speakers as *Duckville* (Danish does not distinguish syllable-final /g/ and /k/), while the other claimed that it would be perceived as *Dockville*. One may draw the conclusion that it was not only the consonant that was wrong – something was also seriously amiss with the first vowel.

In this paper all vowels will be referred to by means of keywords. For English (RP) those suggested by Wells (1982) have been adopted, and similar keywords have been designated for Danish. Henceforth, where necessary, English RP and Danish will be abbreviated E and D, respectively.

The distinction between E STRUT (/ʌ/) and LOT (/ɒ/) is notoriously difficult for Danes, who tend to perceive both sounds in terms of the Danish vowel henceforth referred to as NOK. The Danish sound is a back-central, slightly rounded vowel with a tongue height between open-mid and open. It is approximately intermediate between STRUT and LOT, and Danes use this vowel indiscriminately as a replacement for both English vowels. But it has never been investigated what the result will be of a direct transfer of the Danish vowel. Will it be perceived by native English speakers for the most part as STRUT or as LOT? This is the question which prompted the investigation, but three more Danish vowels were included which were also suspected of being heard as either one of two possible English counterparts. The vowels concerned are listed in Table 1.

<i>Danish vowels</i>		<i>English vowels</i>	
Keyword, phoneme and realisation	Example	Two English counterparts	Example heard as:
MÆT /ɛ/ [e]	<i>let</i> ("easy")	KIT – DRESS	<i>lit</i> or <i>let</i> ?
KAT /a/ [ɛ̝] (variant 1)	<i>Mads</i> (boy's name)	DRESS – TRAP	<i>mess</i> or <i>mass</i> ?
TAK /a/ [ä] (variant 2)	<i>bak</i> ("back (up)")	TRAP – STRUT	<i>back</i> or <i>buck</i> ?
NOK /ʌ/ [ʌ ^{ɔ̃}]	<i>slot</i> ("castle")	STRUT – LOT	<i>slut</i> or <i>slot</i> ?

Table 1. Four Danish vowels and the two English counterparts in each case. Note that the Danish /a/ phoneme has two very different allophones; it is realised as [ɛ̝] in open syllables and before coronals, and [ä] before labials and dorsals.

¹ This study has been carried out in collaboration with my colleague Inger M. Mees. A more detailed analysis of the results will be presented elsewhere in a joint publication.

Our own predictions about associations between Danish input vowels and perceived English vowels were as follows, based on auditory impressions from our classes in the language laboratory (→ here means “will be perceived as”):

MÆT	→	KIT	(predominantly)
KAT	→	DRESS	(predominantly)
TAK	→	TRAP/STRUT	(no clear impression, perhaps mainly STRUT)
NOK	→	STRUT	(only a weak impression)

The typical realisations of these Danish and English vowels can be seen in the vowel diagram in Figure 1. Information about the Danish vowels is mainly derived from Grønnum (2005); for the English RP vowels the main sources are Cruttenden (2001), Roach (2004) and Wells (2000).

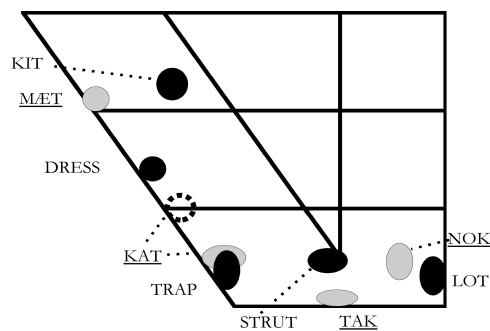


Figure 1. Danish vowels (shaded grey, underlined text) and perceptually most similar English vowels (black). Note that D_{KAT} is traditionally placed between open-mid and open but younger standard Danish speakers tend to use a closer quality (dashed circle).

The prediction about *KAT* seems to be contradicted by the diagram, where both E_{TRAP} and D_{KAT} are shown as unrounded front vowels between open-mid and open. This would lead us to predict a very strong association of *KAT* with *TRAP*. However, the realisation of *KAT* is often considerably closer for younger speakers (dashed circle), while a more open *TRAP* vowel is now common in RP (Cruttenden 2001: 111).

Method

A list of 18 words was compiled, each word containing one of the four Danish vowels in stressed position. All the Danish words had two English counterparts with different vowels as indicated in Table 1. The complete list is shown in Table 2.

The words in Table 2 were recorded once by six female Danish native speakers (age range 20-24 years) and the resulting single-word audio files were arranged in a listening experiment conducted over the Internet.² Listeners were told that they would hear pronunciations of English words by Danish speakers and were asked to indicate which one of two possible words they heard. In total 29 listeners participated. The listening test was split into two versions (with some items in common) so as to reduce listener fatigue, and also diminish the risk of listeners basing their responses on answers to previous items. Listeners heard either version 1 or version 2, not both.

² My thanks to Nicolai Pharao, Bev Collins and Michael Ashby for finding participants.

Material – Danish and English words in the experiment										
Vow.	D	E	D	E	D	E	D	E	D	E
MÆT	<u>seks</u>	<i>six</i> <i>sex</i>	<i>let</i>	<i>lit</i> <i>let</i>	<i>net</i>	<i>knit</i> <i>net</i>	<i>pest</i>	<i>pissed</i> <i>pest</i>	<i>læst</i> <i>(sb.)</i>	<i>list</i> <i>lest</i>
KAT	<u>Mads</u>	<i>mess</i> <i>mass</i>	<i>sat</i>	<i>set</i> <i>sat</i>	<i>mat</i>	<i>met</i> <i>mat</i>				
TAK	<u>kap</u>	<i>cap</i> <i>cup</i>	<i>bak</i>	<i>back</i> <i>buck</i>	<i>mak</i>	<i>mack</i> <i>muck</i>				
NOK	<i>godt</i>	<i>gut</i> <i>got</i>	<i>slot</i>	<i>slut</i> <i>slot</i>	<i>stok</i>	<i>stuck</i> <i>stock</i>	<i>lok</i>	<i>luck</i> <i>lock</i>		
	<u>dollar</u>	<i>duller</i> <i>dollar</i>	<i>hobby</i>	<i>hubby</i> <i>hobby</i>	<i>Tommy</i>	<i>tummy</i> <i>Tommy</i>				

Table 2: 18 Danish words together with corresponding English words used as choices in the listening experiment. The 4 underlined words occurred in both versions of the test.

Results and discussion

The overall results for each of the Danish words and vowel categories are listed in Table 3. Scores from the two versions of the test have been grouped since analyses of the common items showed no fundamental differences between the two.

Distribution of answers for each word in percent. N = 87/174 (see caption)											
MÆT	KIT	DRESS	KAT	DRESS	TRAP	TAK	TRAP	STRUT	NOK	STRUT	LOT
<i>læst</i>	98	2	<u><i>Mad</i></u> <i>s</i>	97	3	<i>bak</i>	93	7	<i>slot</i>	67	33
<i>pest</i>	97	3	<i>mat</i>	91	9	<i>mak</i>	78	22	<i>stok</i>	60	40
<i>net</i>	93	7	<i>sat</i>	85	15	<u><i>kap</i></u>	65	35	<i>lok</i>	51	49
<i>let</i>	93	7							<i>godt</i>	44	56
<u><i>seks</i></u>	68	32							<i>Tomm</i> <i>y</i>	38	62
									<u><i>dollar</i></u>	34	66
									<i>hobby</i>	17	83
Mean	86	14	Mean	93	7	Mean	75	25	Mean	43	57

Table 3. Main results: distribution of answers shown for each Danish word and for 4 vowel categories across all words within a category. All recordings of same word included, i.e. 6 recordings of the words occurring in both versions (*seks*, *Mads*, *kap*, *dollar*, N = 174) and 3 for the other words (N = 87). English words shown in Table 2.

It appears from Table 3 that the Danish MÆT vowel was generally heard as E KIT (e.g. D *let* heard as E *lit* rather than *let*). If the Danish word *seks*, which triggered more DRESS responses than the other words, were excluded, the ratio would be 15:1 rather than 8:1. This clear preference for KIT over DRESS exceeded our expectations and could not possibly have been predicted from the juxtaposition of the three vowels in Figure 1.

The KAT vowel yielded an even more overwhelming preference for the closer of the two English vowels, namely DRESS (rather than TRAP). This is surprising given that the traditional descriptions treat D_{KAT} and E_{TRAP} as being virtually identical. It reflects the fact that over the years two contrary vowel shifts have taken place in English and Danish. D_{KAT} has become closer whereas E_{TRAP} has become more open. Furthermore, Hawkins and Midgley (2005) found in the case of their youngest speakers (age range 20-25 years) a higher F1 – indicating more open articulation – not only for TRAP, but also for DRESS. It may well be that the relatively closer quality of the younger Danes' KAT is now similar to the opener quality of younger RP speakers' DRESS.

Although less striking, the results for D_{TAK} were also relatively clear, but surprisingly (at least to Danish teachers of English) this vowel was more often associated with E_{TRAP} (rather than STRUT) by a 3:1 ratio. Such a finding has significant consequences; the pedagogical strategy commonly used to assist learners to acquire STRUT has been not to use NOK but instead to aim for the Danish TAK vowel (in order to arrive at a suitably frontier articulation). The present result suggests that an unmodified transfer of the TAK vowel for STRUT would be to say the least unfortunate and might lead to more – not fewer – native speaker misidentifications; they might hear a Danish pronunciation of *luck* as *lack* – rather than *lock*, which would have been the original concern.

The vowel which prompted this investigation — D_{NOK} — turned out to be the one least clearly associated with a particular English vowel. There was only a slight overall preference for LOT over STRUT, and the individual variation between the 7 words in this category makes it hard to draw any clear conclusions, except perhaps that D_{NOK} does not appear to be an effective substitute for either LOT or STRUT. In consequence, the question of whether the typical Danish mispronunciation of *Dogville* will be heard as *Dockville* or *Duckville* remains open. Furthermore, three LOT words were more frequent than the corresponding STRUT words, e.g. *hobby* versus *hubby*. The preference for LOT in these cases may (in part) be the result of listeners selecting the more common of the two alternatives (this situation was difficult to avoid because of the requirement that the English word pairs should be matched by appropriate Danish equivalents).

Taken overall, we found the simple experiment to be remarkably revealing, inasmuch as it confirmed some of our hunches, disproved others and (most significantly) indicated clearly that the current textbook descriptions of Danish and English give inaccurate predictions about the auditory consequences of transferring Danish vowels to English.

References

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