

# The Pronunciation of (r) in Standard Dutch

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## 1. Introduction

In the languages of the world the category of rhotics consists of a disperse set of sounds: trills, taps, flaps, fricatives and approximants, with varying places of articulation (alveolar, retroflex, uvular) (Ladefoged and Maddieson 1996; Walsh Dickey 1997). In Dutch, almost the complete range of /r/ sounds has been observed, even within the standard variety. In this paper we will discuss the pronunciation of /r/ in northern (spoken in the Netherlands) and southern (spoken in Flanders) standard Dutch. We focus on postvocalic /r/ as in this position more variation shows up (Vieregge and Broeders 1993:269). In this paper we aim to give insight into the patterns of realization of postvocalic /r/ in standard Dutch from the 1930s until now. This aim will be reached by giving an inventory of the different variants and their frequencies, by analyzing the underlying phonetic dimensions and by constructing a speaker typology on the basis of the clustering of variants.

The paper is structured as follows. In section 2 a brief review of the observations in the literature is presented. In spite of its chameleontic nature, Dutch /r/ has hardly been studied by variationists. The design of our real time study of postvocalic /r/ is sketched in section 3. The results are presented in section 4. First, we give an overview of the variation found, both between speakers and within speakers. Next, we attempt to classify the variants found on more general phonetic dimensions instead of specific phonetic features. Finally, we try to classify the speakers by means of a cluster analysis on the basis of the (r) variants they use. The outcome is a typology of Dutch /r/ speakers. The conclusions are presented in section 5.

## 2. The realization of /r/ in Dutch

Despite its heterogeneous nature and its status as a stereotype, Dutch /r/ has hardly been studied by dialectologists, sociolinguists and phoneticians.<sup>1</sup> According to the Dutch pronunciation guides and phonological descriptions,<sup>2</sup> the only accepted

realizations of /r/ in standard Dutch until recently were the trilled realizations [ʀ] and [r], with the uvular trill gaining in frequency and prestige,<sup>3</sup> especially in the Netherlands (Van Haeringen 1924; Zwaardemaker and Eijkman 1928; Blancquaert 1934; Hol 1951; Damsteegt 1969; Mees and Collins 1982; Vieregge and Broeders 1993), but recently also in Flanders (Rogier 1994). However, a wide range of other variants is described: [r], [x], [χ] [ə], [ɹ], [ɻ] [u], [ɣ], [j] and [ɹ̥]. All these variants seem to be acceptable in standard Dutch now,<sup>4</sup> including the retroflex [ɻ], commonly labelled as *Gooise r*, which seems to be spreading very rapidly, especially among children and young middle class women (Van den Toorn 1992; Van de Velde 1996; Stroop 1998).<sup>5</sup> Gussenhoven (1992) typifies /r/ in (the western variety of) northern standard Dutch as [r], but according to Vieregge and Broeders (1993) the uvular approximant [ɣ] is the most common variant in contemporary northern standard Dutch.<sup>6</sup>

### 3. Method

#### 3.1 Corpus

The study is based on a corpus of radio broadcasts collected for a real time study of variation and change in standard Dutch speech (Van de Velde 1996; Van de Velde et al. 1997). The external variables are community (The Netherlands vs. Flanders), programme type (royal reports vs. sports commentaries) and period (1935, 1950, 1965, 1980, 1993). The broadcasters (N=68) are all males, between 29 and 36 years old at the moment of recording. Per speaker ten minutes of spontaneous speech was collected. An overview of the corpus is presented in Table 1.

Table 1. *Design of the study of variation and change in standard Dutch speech. Number of speakers split up by community, programme type and period (N=68).*

		1935	1950	1965	1980	1993
The Netherlands	royal	5	5	5	5	5
	sports	5	5	5	5	5
Flanders	royal	3		3		3
	sports	3		3		3

For every speaker a maximum of 20 realizations of /r/ after a fully stressed vowel were transcribed, equally spread over two contexts:

- (1) word final position (e.g. *zwaar* 'heavy', *duur* 'expensive'): vowels, semi-vowels and liquids are excluded as following segments, as they can trigger spread of /r/ to the onset of the following syllable and/or affect the nature of /r/.
- (2) followed by a word final dental plosive which is pronounced voiceless in Dutch (e.g., *zwaard* 'sword', *buurt* 'neighbourhood').

The total number of realizations transcribed for the 68 speakers is 1310, which is slightly lower than the maximum as not all speakers provided 20 usable (r) occurrences within the ten minutes of speech selected.

### 3.2 Variants

The ten variants of (r) distinguished in the phonetic transcription are listed in Table 2. Next to the label, the IPA phonetic symbol and some descriptive information is given.

Table 2. *Overview of the variants of (r)*

label	IPA	information
zero realization		complete deletion of (r)
schwa	ə	central vocalic realization
uvular trill	ʀ	also includes trilled (voiced/voiceless) fricatives
back approximant	ʋ ɣ	velar and uvular approximant or vocalic realizations
alveolar trill	r	at least two trills
alveolar tap	ɾ	also includes the flap and alveolar trills with one trill
front approximant	ɹ ɻ	
retroflex	ɻ	consonant and approximant realizations
fricative	x χ	untrilled velar or uvular voiceless fricatives <sup>7</sup>
palatal glide	j	

## 4. Results

### 4.1 Inter- and intra-speaker variation

Table 3 gives an overview of the frequencies of the (r) variants found in our corpus. First of all, the total number of realizations (n=1310) is split up for the ten variants found. Both the raw frequencies and the percentages are given. Next, the number of informants using the variant in question is given, split up for speech community. Table 3 shows large differences in frequencies between the variants. Fricatives and

palatal glides are extremely rare. The alveolar trill and tap are the most common variants and are produced at least once by more than 70% of the speakers. A lot of variants are only used once by a substantial number of speakers. Some low frequency variants are used by more than half of the speakers (zero realization, schwa and front approximant). Such results point out that there is a lot of variation between speakers.

Intra-speaker variation is evident from Table 4, which shows the number of speakers that use a specific number of different variants (ranging from one to seven). Only 13 speakers show complete absence of variation in (r). Twelve of these speakers use an alveolar trill, one a uvular trill. They are all Flemish speakers. The remaining 55 speakers use more than one variant, 36 of them even have five or more different realizations. Additional evidence for the high inter- and intra-speaker variation is presented in Van de Velde (1996:139–142), where speaker index scores and standard deviations per variant are presented.

Table 3. *Frequencies of (r) variants found in our corpus (total number of observations is 1310) and their share percentagewise, plus the number of Flemish (N FL) and Dutch (N NL) informants using the variant (total number of informants is 68).*

variant	n	%	N FL	N NL
zero realization	88	5.9	3	40
schwa	113	8.7	1	42
uvular trill	114	8.7	2	20
back approximant	51	3.9	0	17
alveolar trill	453	34.7	17	31
alveolar tap	286	21.9	3	47
front approximant	150	11.5	0	35
retroflex	48	3.7	0	14
fricative	4	0.3	0	4
palatal glide	3	0.2	0	2

Table 4. *Types of (r) by number of speakers*

types of (r)	1	2	3	4	5	6	7
speakers	13	8	2	9	15	15	6

#### 4.2 *Phonetic dimensions*

A logit analysis or an analysis of variance of our (r) data to test the significance of the external factors would have been inappropriate, as inter- and intra-speaker

variation is too high, given the number of variants and observations. In order to check for more general patterns of variation in the realization of (r), the variants were ordered along two phonetic dimensions: articulatory effort and place of articulation.<sup>8</sup>

In decreasing order of articulatory effort four categories are distinguished, ranging from trills to no realization at all:

- (1) trilled realizations: [ʀ] and [r].
- (2) consonantal realizations: [r], [ɾ], [ɹ],<sup>9</sup> [x] and [χ].
- (3) approximant or vocalic realizations: [ə], [ɪ], [ʊ], [ɣ] and [j].
- (4) zero realizations.

A high index score (maximum 100) reflects high articulatory effort, a low index score reflects low articulatory effort in the realization of (r).

For place of articulation a distinction is made between 1. [+front] and 2. [–front] realizations. [r], [ɹ], [ɾ], [ɹ̥] and [ɹ̥̥] are categorized as [+front], all the other realizations as [–front]. A high index score (maximum 100) reflects a high number of front realizations.

In Figures 1 and 2 the results for (r)effort and (r)place are visualized, split up by community and period. For the Netherlands the individual scores are marked with a circle; the mean scores (per period) are marked with a larger circle and connected with a full line. The index scores of the Flemish individuals are marked with a small cross; the mean scores have a larger symbol and are connected with a dotted line.<sup>10</sup>

It is clear that there is a large difference in (r)effort between the Netherlands and Flanders and that the differences have become larger between 1935 and 1993. In Flanders there is almost no articulatory reduction of (r), but in the Netherlands there is a lot of reduction. This is confirmed by an analysis of variance (anova), in which only the three periods that are studied in both communities — 1935, 1965 and 1993 — are included. There is a significant interaction of the factors community by period ( $F=3.352$ ,  $df=2,42$ ,  $p=.045$ ,  $\eta^2=.034$ ), with main effects of community ( $F=134.415$ ,  $df=1,42$ ,  $p=.000$ ,  $\eta^2=.683$ ) and period ( $F=4.392$ ,  $df=2,42$ ,  $p=.019$ ,  $\eta^2=.045$ ). Separate analyses for Flanders and the Netherlands were conducted, containing all data and testing for the factors programme type (royal reports vs. sports commentaries) and period. For the Flemish data there are no significant effects (programme type:  $F=.572$ ,  $df=1,12$ ,  $p=.464$ , period:  $F=.1014$ ,  $df=2,12$ ,  $p=.392$ ). In southern standard Dutch reduction of (r) is very rare and (r) is almost always realized with maximal articulatory effort, i.e. as a trill. In the Netherlands there is a significant effect for the factor period (period:  $F=4.223$ ,  $df=4,40$ ,  $p=.006$ ,  $\eta^2=.272$ , programme type:  $F=.088$ ,  $df=1,40$ ,  $p=.768$ ), showing that there is a shift over time in articulatory reduction of (r) in northern standard Dutch. Especially

between 1980 and 1993 there is a clear shift. There is also much more inter-speaker variation in northern than in southern standard Dutch.

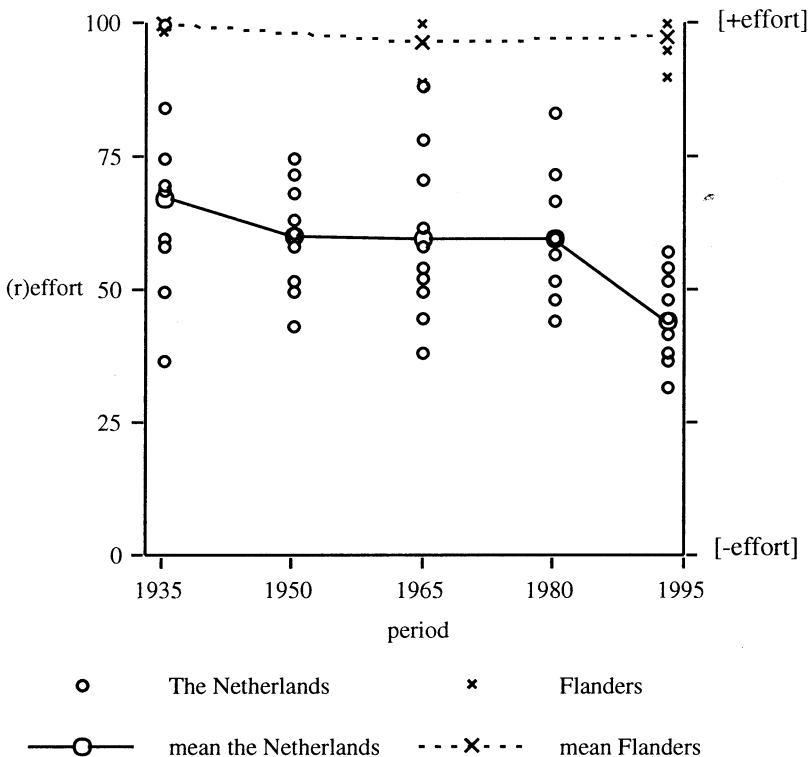


Figure 1. Articulatory effort of (r) split up by community and period

For (r)place (Figure 2) there is a clear difference in place of articulation between the Netherlands and Flanders (community:  $F=9.384$ ,  $df=1,42$ ,  $p=.004$ ,  $\eta^2=.169$ , period:  $F=.478$ ,  $df=2,42$ ,  $p=.623$ ): (r) is realized more to the front in Flanders than in the Netherlands. Inter-speaker variation is much higher in the Netherlands than in Flanders. In southern standard Dutch there are no significant effects for programme type ( $F=1.815$ ,  $df=1,12$ ,  $p=.203$ ) and period ( $F=.593$ ,  $df=2,12$ ,  $p=.568$ ). The lower score for 1993 is caused by one speaker exclusively using [ʃ]. Almost all Flemish speakers exclusively have front realizations. In northern standard Dutch too there are no significant effects (programme type:  $F=.846$ ,  $df=1,40$ ,  $p=.363$ , period:  $F=2.030$ ,  $df=4,40$ ,  $p=.109$ ). Our results contradict the observations in the

literature claiming that there has been a shift from front to back realizations in the Netherlands and that back realizations are the most common ones in northern standard Dutch.

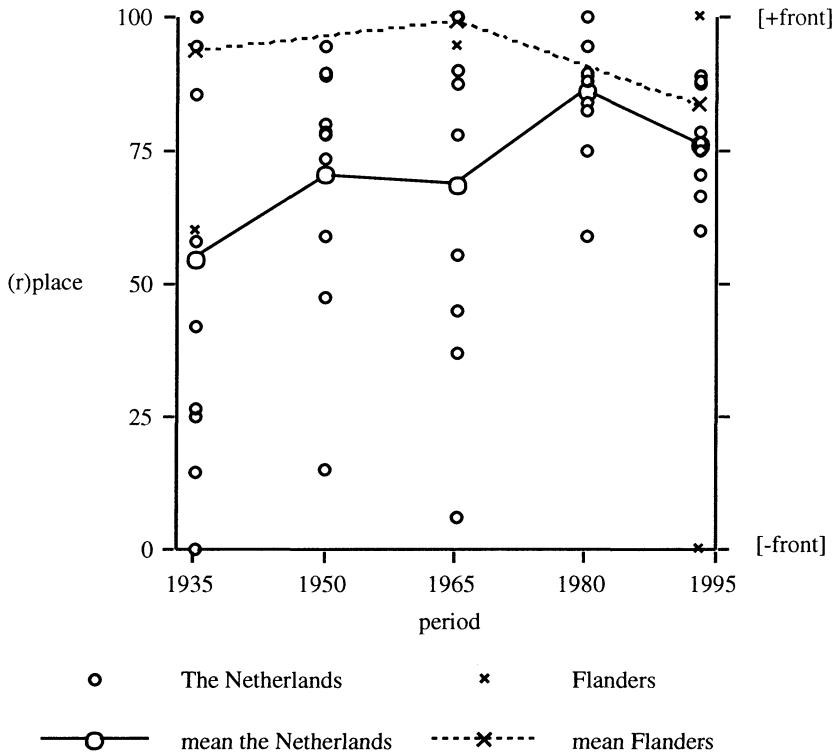


Figure 2. Place of articulation of (r) split up by community and period

#### 4.3 Cluster analysis

The frequency figures show global differences between the Netherlands and Flanders and the impact of the time factor in the Netherlands. However, we want to detect general patterns of variation which reveal whether certain variants systematically co-occur within speakers and whether it is possible to construct a typology of (r) speakers. Therefore we conducted a cluster analysis. For this analysis the data matrix was reduced. The extreme low frequent variants [x], [χ] and [j] (see Table 3)

were dropped from the analysis to avoid the risk of overestimating their impact in the cluster analysis. Schwa and the zero realization were taken together as both can be seen as an extreme form of (r) reduction. The stylized results of a dendrogram analysis are presented in Table 5. The speakers are clustered in groups on the basis of their most frequent variant and the other variants co-occurring with this core variant (labelled as core and secondary variant). We also list period and community characteristics of the group and the number of speakers belonging to it (N).

Table 5. *Typology of (r) speakers*

core variant	secondary variant	N	characteristics
alveolar trill	-	12	These speakers exclusively use [r], 11 Flemish speakers and 1 Dutch 1935 speaker.
	reduced / tap	5	4 Flemish speakers and 1 Dutch 1965 speaker, who all sporadically use reduced variants or taps.
	uvular trill	1	Flemish 1935 speaker.
front approximant	mixed retroflex	3	Dutch speakers, 1950 (2) and 1993 (1).
		4	[ɾ] and [ɻ] have the highest frequency; the retroflexes mainly co-occur with [ə], all other variants are used occasionally; Dutch 1965 (2) and 1993 (2) speakers.
	tap	8	Dutch speakers, mainly from 1993 (5); 1 from 1935, 1965 and 1980.
alveolar tap	reduced	12	Dutch speakers, mainly from 1980 (6), 1 from 1935 and 1993, 2 from 1950 and 1965.
	alveolar trill	13	1 Flemish 1965 speaker. 12 Dutch speakers: 1935 (2), 1950 (4), 1965 (3), 1980 (3) and 1993 (1).
uvular trill	mixed	9	Dutch speakers from 1935 (5), 1950 (2) and 1965 (2); mainly in combination with back
	-	1	realizations. Flemish 1993 speaker

On the basis of the core variant four main groups of speakers can be distinguished, having the alveolar trill, the front approximant, the alveolar tap or the uvular trill as their most typical pronunciation. It is clear that front realizations are dominating in standard Dutch: 58 out of 68 speakers have a front realization as the most common one; only ten speakers have a back one as the most common variant. The group of alveolar trill speakers (N=18) is the most homogeneous one. Except for one Dutchman, they are all speakers of southern standard Dutch. The largest number of



them (N=12) exclusively produce alveolar trills, four speakers combine [r] with reduced realizations or taps. The secondary variant has a very low frequency. One Flemish 1935 speaker uses both trilled realizations [r] and [ʀ]. This speaker wrote to us that he was criticized by the language advisor of the Flemish broadcasting corporation for his [ʀ] pronunciation and that he had to pronounce [r]. He did not succeed in doing this consistently. There is only one Flemish speaker who does not belong to this group: a 1993 broadcaster (originating from Limburg) who exclusively has a uvular trill. He is the only speaker in the corpus who exclusively uses [ʀ]. All other speakers (N=9) using this variant most frequently are speakers of northern standard Dutch from the periods 1935, 1950 and 1965. They mix [ʀ] with a wide variety of other realizations, except [ʀ] and [ɹ].

In the group of front approximant speakers (N=15) the largest subgroup combines [ɹ] with [r]. A second subgroup are the four speakers having the retroflex realizations [ʁ] and [ɻ] as the most common variants. Apart from [ɹ] occasional realizations of all other variants are found. [ʁ] and [ɻ] are still not widely spread in the speech of male broadcasters, but it should be observed that retroflex realizations already occurred in 1965. A third and small subgroup of front approximant speakers combine [r] with low frequent realizations of all other variants.

The largest group are the [r] speakers (N=25). They can be divided into two subgroups. 12 Dutch speakers combine [r] with the reduced variants (i.e. zero realizations and [ə]). Other variants are used occasionally. 13 speakers use [r] and [ʀ] more or less proportionally. Among them there is one Flemish speaker.

## 5. Conclusion

The cluster analysis enabled us to detect general patterns in the realization of (r) in standard Dutch and to construct a typology of /r/ speakers. We were able to present an ordering and classification of the different variants of /r/, which has obvious similarities with the classification suggested by Walsh-Dickey (1997).

There are obvious differences between northern and southern standard Dutch. Inter- and intra-speaker variation is much higher in the Netherlands than in Flanders. Most Flemish speakers use only one variant. In southern standard Dutch two variants are commonly used: [r] and [ʀ]. Alveolar [r] is by far the most frequent variant used by the Flemish broadcasters, [ʀ] seems to spread in Flanders but this needs further investigation. In the Netherlands trilled realizations have almost completely disappeared in postvocalic position. Dutch shares this tendency of articulatory reduction of postvocalic /r/ with most other Germanic languages (Lindau 1985). In our corpus of broadcasting speech front realizations, particularly [r] and [ɹ], dominate. The dialect maps of Van Reenen (1994) show that front

realizations — as opposed to back ones — are the most widely spread variants in the Netherlands. Particularly in the Randstad area — the economically and linguistically dominating part of the Netherlands — front realizations have a strong position. Furthermore, the retroflex variants that seem to be spreading very rapidly across the Dutch language area, are front realizations too. Therefore, we dare to conclude that front realizations are the most common ones in northern standard Dutch. The claim that there has been a shift from front to back realizations in northern standard Dutch has to be rejected. The most obvious shift in northern standard Dutch is articulatory reduction.

In terms of variants the changes in progress in northern standard Dutch seem to follow two paths, depending on the place of articulation. For the front realizations the pattern of reduction seems to involve the following steps: [r]  $\Rightarrow$  [ɹ]  $\Rightarrow$  [ɹ̥], [ɹ̥] and [ɹ̥̥]. For the back realizations the shift observed in our data is [ʀ]  $\Rightarrow$  [ʀ̥]. There is a lot of intra-speaker variation in northern standard Dutch. On the combination of variants there only seems to be one restriction: the uvular trill and the retroflex realizations do not co-occur in our corpus.

More research is needed to describe and understand the patterns of variation and change in which Dutch /r/ is involved. First, the allophones of /r/ should be described from a perceptual, articulatory and acoustic point of view.<sup>11</sup> Second, from a phonetic and phonological point of view it is important to investigate potential patterns of mapping with the velar (or uvular) fricatives /x/ and /χ/. Third, studies of the geographical and social distribution of the variants of /r/ would broaden our insight in the mechanisms ruling language variation and change. Finally, Dutch /r/ should be compared cross-linguistically with patterns of variation and change of /r/ found in other Germanic languages (Lindau 1985).

### Notes

1. An overview of the literature is presented in Van de Velde (1996:126–128).
2. In a lot of these studies phonetic symbols and terminology do not seem to be used consistently and / or adequately.
3. Linguists agree on the fact that [r] is the old variant of Dutch and that [ʀ] is an innovation, but they disagree on the origin and the spread of the innovation. Van Haeringen (1949) and Chambers and Trudgill (1980) claim that Dutch [ʀ] originates from French. Upper class people in The Hague are believed to have started using [ʀ] in the course of the 17<sup>th</sup> and 18<sup>th</sup> century when speaking French. They supposedly introduced this prestigious [ʀ] in their pronunciation of Dutch. With The Hague as its centre, [ʀ] supposedly spread by way of the other big cities over the rest of the Netherlands. Van Reenen (1994) contradicts this claim. He does not deny the French connection, but limits its influence to The Hague and surrounding

area. His dialect maps show that a uvular realization is predominantly found in the south and east of the Netherlands and that it is spreading from Germany, where [ʀ] already existed in the 14<sup>th</sup> century, long before it was observed in French. In Paris the evolution of [r] to [ʀ] occurred at the end of the 17<sup>th</sup> century. It is possible that [ʀ] was used among upper class speakers of French in the Hague, but according to Howell (1986) it is very unlikely that a (subphonemic) characteristic of a foreign language is introduced in the mother tongue. However, it is not impossible and Howell's thesis that the upper class shift from [r] to [ʀ] is the result of a natural phonetic tendency is contradicted by the data of the UCLA Phonological Segment Inventory Database (UPSID). Only 1% of the r-sounds are uvular in the languages of the world (Verhoeven 1994:10), and [ʀ] almost exclusively occurs in Western Europe. [ʀ] in the Flemish province of Limburg probably has the same origin as [ʀ] in the Netherlands (i.e. spreading from Germany), but in other areas, e.g. in Ghent and surrounding areas and across the Dutch-French language border, [ʀ] is the result of French influence (De Gruyter 1909; Rogier 1994).

4. These variants occur in the speech of standard speakers, see Table 3.
5. In the Dutch literature (e.g. Van de Velde 1996) retroflex is commonly described as a manner of articulation (the tip of the tongue is curled upwards and backwards). According to Laver (1994:216) it involves by definition a displacement in the place of articulation. The IPA system considers retroflex as a place of articulation between postalveolar and palatal (IPA 1993).
6. Vieregge and Broeders (1993) base their conclusions on a study of the speech of seven informants from various parts of the country. However, their geographic origin is not specified and it is possible that they mainly originate from regions where uvular realizations are dominant.
7. In our corpus voiced fricatives were not found as realizations of (r).
8. The categorization slightly differs from the one presented in Van de Velde (1996). As [j] is an approximant it shifted from category 2 to 3 for articulatory effort (this only marginally affects the index score of two speakers). For place of articulation the retroflex realization is defined as [+ front].
9. In our transcriptions we did not distinguish a retroflex flap ([ɾ]) from a retroflex approximant ([ɹ]). We have put both variants in the second category.
10. If speakers from the same period and community have the same index score for a variable there is only one symbol visible in Figures 1 and 2.
11. One of the interesting questions is whether a velar trill exists in Dutch. According to the IPA character set it is a sound which has not been annotated in any of the world's languages.

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