

IDENTIFICATION OF LANGUAGE VARIETIES

The Contribution of Different Linguistic Levels

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Three experiments are described investigating the role of different linguistic levels in the identification of language varieties. The results reveal that prosodic features play a minor role in the identification of language varieties, both in the United Kingdom and in the Netherlands. The role of pronunciation varies. In some cases, pronunciation alone leads to better identification than cues at all linguistic levels, including pronunciation. Further research is needed to gain insight into the precise nature of the processes underlying the identification of language varieties. Also, the role of identification of language varieties in relation to vocal stereotypes in the attribution of personality characteristics to speakers should be further investigated.

Most research on language attitudes to date can be called “global” in the sense that it is based on integral speech samples, either read or spontaneous. One of the few studies of the role of different linguistic levels in this context is van Bezooijen (1988). In this study, spontaneous speech fragments of speakers of the Nijmegen dialect were manipulated electronically to create three different versions: (a) low-pass filtered, retaining prosody and eliminating pronunciation, verbal content, and voice quality; (b) random spliced, retaining voice quality and eliminating verbal content and most of the pronunciation and prosody; and (c) typescript, retaining verbal content and eliminating pronunciation, prosody, and voice quality. By comparing the personality judgments in the various versions with each other and with the nonmanipulated integral speech fragments, insight was gained into the contribution of different speech cues. In addition, correlations were assessed between perceptual descriptions of speech parameters and attributions. In this way, it was found, for example, that prosody is the most powerful trigger of personality attributions. Intraculturally (by Dutch listeners), as well as cross-culturally (by British, Kenyan, Mexican, and Japanese listeners), a “lively” manner of speaking is strongly

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associated with dominance, willpower, and self-confidence. As expected, pronunciation, allowing dialect identification, only played a role intraculturally.

The study by van Bezooijen (1988) was based on speech samples of one Dutch dialect, with speakers of different socioeconomic status. However, language attitudes are known to vary for different language varieties. This appears from research on aesthetic evaluation (Giles, 1970; van Bezooijen, 1994) and also from personality attribution research (van Bezooijen & Ytsma, in press). It is therefore important to know to what extent naive listeners are able to identify different language varieties and also on what cues their identification is based. The first question has been examined in a number of studies, at least for Dutch (e.g., Boets & De Schutter, 1977; van Bezooijen, 1994; Van Hout & Münstermann, 1981). To our knowledge the second question has not been investigated in a systematic manner. It is the central question of the research presented here.

To assess the relative importance of different linguistic levels for the identification of language varieties, we ran three experiments. In the first experiment, Dutch listeners were presented with spontaneous speech samples of Dutch regional varieties in three versions: integral (all information), verbal (all information but intonation), and prosodic (no information but prosody, i.e., variations in pitch [the sequence of rises and falls during the course of the utterance], variations in tempo, and variations in loudness). In the second experiment, the Dutch experiment was replicated for language varieties in the United Kingdom. In an effort to enhance the "identificatory power" of the prosodic level, a fourth version was added, with specially selected regionally marked prosody. In the third experiment, standard Dutch speech samples read by dialect speakers were presented for identification. In this experiment, only segmental phonetic (and perhaps some prosodic) cues were present.

EXPERIMENT 1. THE CONTRIBUTION OF VERBAL AND PROSODIC INFORMATION TO THE IDENTIFICATION OF DUTCH LANGUAGE VARIETIES

This experiment aimed at assessing the relative contribution of prosody versus other ("verbal") characteristics of speech to the identification of regional varieties in the Netherlands and the Dutch-speaking part of Belgium by speakers of the standard language from the Netherlands. The experiment was based on spontaneous speech samples. The linguistic levels were separated by means of monotonization and low-pass filtering.

METHOD

The identifiability of four regional dialects was assessed: the varieties spoken in Bedum (in the northeast of the Netherlands), The Hague (west of the Netherlands), Maastricht (southeast of the Netherlands), and Uitbergen (west of the Dutch-speaking part of Belgium).¹ These varieties are geographically and linguistically distant from each other and differ to varying degrees and in various ways from standard Dutch. Their location is shown in Figure 1.

Three speakers were included for each variety. They were between 27 and 48 years of age, had all been born and raised in the respective places, and spoke the local dialects. Because research has revealed some relationships between voice quality and dialect (Esling, 1978; Trudgill, 1974), speakers were selected who were judged by professional dialectologists/phoneticians not to produce voice qualities characteristic of specific dialects. The speakers were interviewed by speakers of the same variety to obtain authentic speech samples. Questions pertained, for example, to food preferences and favorite television programs. For each speaker, a speech fragment of between 15 and 20 seconds was constructed, with utterances from different parts of the interviews. Fragments containing semantic information that could betray the speakers' regional background, either explicitly or implicitly, were discarded.

Twenty-four speakers of standard Dutch, 12 men and 12 women, participated as listeners. Their ages ranged from 19 to 26. They came from different regions in the Netherlands, but not from Bedum, Maastricht, or The Hague, that is, the places where the speakers originated from. Also, there were no listeners from Belgium. Most listeners were students at universities. Students of general linguistics or Dutch were excluded because their knowledge of language varieties might differ from that of the general public.

The speech fragments were presented to the listeners in three different versions:

1. *Prosodic*. By lowpass filtering the signal at 350 Hz the speech was rendered unintelligible. The only thing provided to the listeners is prosodic information. The fragments sound as if spoken through a thick wall.
2. *Verbal*. By means of electronic monotonization (at a fixed value of 109 Hz, i.e., the mean pitch over all listeners) the intonation was removed from the signal. Monotonization was affected through Pitch Synchronous Overlap and Add (PSOLA) analysis and resynthesis (Moulines & Verhelst, 1995). Verbal information is maintained, as well as temporal and loudness variation. The fragments are completely intelligible, but perfectly monotonous.
3. *Integral*. In this version all prosodic and verbal information is present.



Figure 1. Location of the Dutch language varieties in Experiment 1 and 3.

The fragments were presented in separate blocks of integral, verbal, and prosodic fragments; in two sequences and in two random counter-balanced orders. Each block was preceded by six practice fragments so that the listeners could get used to the task. The listeners were instructed to determine as precisely as possible the geographic origin of the speakers. They could indicate their choice by ticking a form with four response levels, as shown in Table 1. To help the listeners make their decision, they were provided with a map of the Netherlands and the Dutch-speaking part of Belgium.

RESULTS

Hardly any responses were given at the level "place" so that only the levels country, region, and province will be discussed. The percentages

Table 1
Form to Be Filled in by the Dutch Listeners

Country	Region	Province	Place
The Netherlands	North	Groningen	
		Friesland	
	East	Drenthe	
		Overijssel	
	Middle	Gelderland	
		Utrecht	
	West	Flevoland	
		North Holland	
	South	South Holland	
		Zeeland	
North Brabant			
Belgium	West	Limburg	
		Standard language of the Netherlands	
	Middle	West Flanders	
		East Flanders	
	East	Antwerp	
		Brabant	
		Limburg	
		Standard language of Belgium	

of missing responses in the integral, verbal, and prosodic versions were respectively 0, 0, and 0 at the level of country; 4, 10, and 20 at the level of region; and 11, 19, and 33 at the level of province. Evidently, listeners were more insecure as less information was provided to them on which they could base their decision. In the following, the missing responses were counted as incorrect responses.

In Figure 2, percentage correct identification is shown, separately for the level of country, region, and province. As expected, the percentages get lower as the level of identification is more specific; this holds for all three versions. When presented in their integral form, 90% of the fragments are identified correctly with respect to the country of origin, 60% with respect to the region of origin, and 40% with respect to the province of origin. These percentages are significantly above chance (χ^2 , $p < .01$). If all response categories are considered equally likely to be chosen by the listeners, percentage correct based on chance is 50, 12.5, and 5.26 for the levels of country (2 response categories), region (10 response categories), and province (19 response categories), respectively.

At the same time there is a consistent tendency for percentage correct to diminish as the fragments contain less information. It can be seen that removing intonation has a much smaller effect than removing verbal information. The mean differences between percentage correct—that is, the loss of identifiability—for the integral and verbal versions are 7%, 2%, and 4% at the levels of country, region, and province,

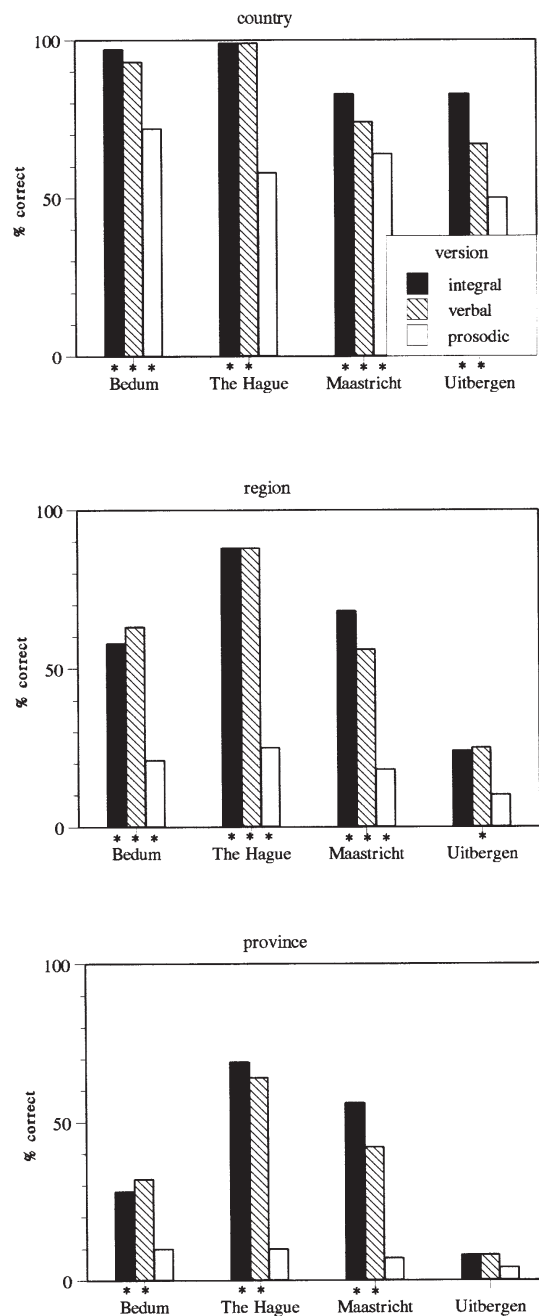


Figure 2. Percentage correct identification of Dutch language varieties in three versions at the level of country, region, and province.

* Identification above chance ($p < .01$).

respectively, whereas the mean differences between the percentages correct for the integral and prosodic versions are 29%, 41%, and 32%. Apparently, in the Dutch language area, identification of the geographic origin of a dialect fragment is possible almost equally well with or without intonation, whereas identification is extremely difficult without verbal information, that is, on the basis of just prosody. Nevertheless, it can be observed that with only prosodic information, the listeners still succeed in identifying Bedum (72%) and Maastricht (64%) significantly above chance at the level of country, and Bedum (21%), The Hague (25%), and Maastricht (18%) at the level of region. At the level of province, none of the four varieties are identified significantly above chance in the prosodic version.

The above results show that the role of prosody in the identification of the Dutch language varieties is rather small. However, some caution is in place. The role of prosody in our experiments may have been played down by the fact that we used short fragments selected at random without special attention to prosody. It is not known how the prosodic characteristics of the language varieties investigated are distributed. It is possible that some varieties have characteristics that appear only rarely and were therefore by chance not included in the fragments. This might hold, for example, for the so-called drag tone, typical of Limburg dialects.

EXPERIMENT 2. THE CONTRIBUTION OF PROSODIC AND VERBAL INFORMATION TO THE IDENTIFICATION OF ENGLISH LANGUAGE VARIETIES

The aim of Experiment 2 is comparable to that of Experiment 1, that is, to assess the relative contribution of prosodic and verbal information to the identifiability of regional varieties. The main difference is the language area: the United Kingdom instead of the Dutch language area. In contrast to Dutch language varieties, intonational characteristics of English language varieties in the United Kingdom have been described extensively (e.g., Douglas-Cowie, Cowie, & Rahilly, 1995; Pellowe & Jones, 1978). In the Netherlands, the only intonational aspects of regional varieties systematically studied are the Limburg lexical tones (e.g., Gooskens & Rietveld, 1995; Verhoeven, 1992). This could point to prosody being a more salient feature of English than of Dutch varieties. Moreover, the two experiments differed in that—in addition to the three versions of the Dutch experiment, that is, integral, verbal, and prosodic—an extra version was added, namely, *prosodic special*. In this version, speech utterances with marked regional prosodic characteristics were presented to the listeners.



Figure 3. Location of English language varieties in Experiment 2.

METHOD

Five English language varieties were examined: those spoken in Liphook (southeast of England), Glasgow (southwest of Scotland), Newcastle (northeast of England), Rhondda (south of Wales), and Belfast (capital of Northern Ireland).² The places are indicated in Figure 3. The method of selecting the speakers (three per variety, between 23

Table 2
Form to Be Filled in by the English Listeners

"Country"	Region	Area	Place
England & Wales	North of England	Northeast Northwest	
	English Midlands	East Midlands West Midlands	
	South of England	Southeast Southwest	
	Wales	North Wales South Wales Standard English	
Scotland & Northern Ireland	Scotland	Northern Scotland Southern Scotland Standard language of Scotland	
	Northern Ireland	Belfast area Outside Belfast area Standard language of Northern Ireland	

and 46 years of age) and obtaining the speech material was as in Experiment 1.

Four versions of the fragments were created. In addition to the integral version and the verbal, monotonized version (with a stable pitch of 110 Hz, the mean pitch over all speakers), there were two prosodic versions: one with randomly selected utterances just like in the Dutch experiment ("prosodic") and one with utterances that had been selected for having dialect-specific prosody ("prosodic special"). This selection was performed by an English linguist specialized in intonation and a Dutch phonetician specialized in intonation and English language varieties.

The task performed by the English listeners was comparable to that of the Dutch listeners. They made a stepwise identification, as shown in Table 2. The most specific level "place" was hardly ever filled in and will therefore be excluded from the results.

The group of English listeners consisted of 13 men and 11 women, ages 18 to 36. They came from all over England, but never from (the surroundings of) Liphook and Newcastle, that is, the places where the English speakers came from. None of the listeners came from Wales, Scotland, or Northern Ireland. All listeners were students at universities; students of linguistics or English were excluded.

RESULTS

Percentage of missing responses in the integral, verbal, prosodic special, and prosodic versions were respectively 0, 1, 0, and 2 at the

level of country; 1, 1, 4, and 4 at the level of region; and 12, 13, 31, and 31 at the level of area. Missing responses were counted as incorrect responses in the subsequent analyses. In Figure 4, the percentage of correct responses is shown separately for the level of country, region, and area. As expected, the percentage correct gets lower as the level of identification is more specific; this holds for all three versions. In the integral version, 92% of the fragments are identified correctly with respect to country, 88% with respect to region, and 52% with respect to area. The percentage correct based on chance is 50, 14.28, and 6.67, respectively. As the numbers of response categories in the Dutch and English experiments are not identical, and, more important, as the relationship between the division into geographic "countries," regions, and, provinces/areas on one hand and dialect features on the other differs, the percentages cannot be compared directly.

Figure 4 shows consistent differences in percentage correct between the integral, verbal, and prosodic versions. The size of the differences is roughly comparable to that found in the Dutch experiment. The mean differences between the integral and verbal versions are 4%, 10%, and 3% for country, region, and area, respectively. For the separate varieties, the difference between these two versions is significant in only one case, namely, for Rhondda at the level of region (integral 79% versus verbal 63%). It can be concluded that removing intonation hardly hinders identification. The mean differences between the integral and prosodic versions are 18%, 43%, and 33%. For the separate varieties the differences between these two versions are significant in all cases, with the exception of Rhondda at the level of country (integral 81% versus prosodic 76%). Removing verbal information is thus shown to have a disastrous effect on identification.

So, just as in the Dutch experiment, verbal features of speech seem to contain many more cues to the geographic origin of a fragment than prosodic features. However, it can be seen in Figure 4 that most English varieties are still identifiable significantly above chance on the basis of just prosodic information, even at the most specific level area. For the Dutch listeners identification proved virtually impossible in this condition.

As mentioned above, an extra condition had been added in the English experiment. In addition to a random prosodic version, a version with typical dialect prosody was included. Indeed, a small positive effect of selecting prosodically typical utterances was found: Differences with the nonselected utterances were 5%, 5%, and 1% at the levels of country, region, and area, respectively. However, if the percentages are contrasted for the five varieties separately, the difference is significant ($p < .01$) only for Belfast, at the level of country and region. For this Irish variety, considerably higher percentages were found with the specially selected utterances than with the randomly selected

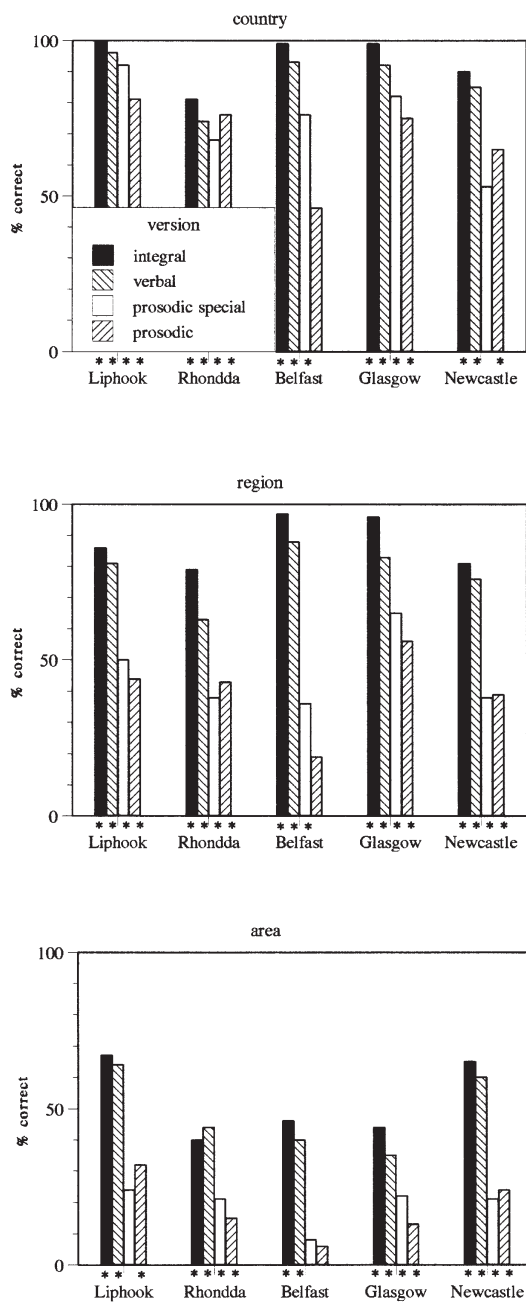


Figure 4. Percentage correct identification of English varieties in four versions at the level of country, region, and area. Identification above chance ($p < .01$).

utterances: a difference of 30% at the level of country and 17% at the level of region.

EXPERIMENT 3. THE CONTRIBUTION OF PHONETIC INFORMATION TO THE IDENTIFICATION OF DUTCH VARIETIES

In the previous two experiments spontaneous speech samples were used that were manipulated electronically to separate (clusters of) linguistic features. A perhaps more natural way is to compare integral spontaneous speech (samples of "dialect") with read speech (samples of "accent"). Whereas spontaneous speech samples (may) contain a wide variety of cues related to their geographic origin, fixed text passages read by speakers with varying geographic backgrounds cannot vary lexically, morphologically, or syntactically. There will only be geographically related variation in pronunciation at the segmental phonetic level and perhaps some geographically related prosodic features. However, the role of the latter is limited, the prosody of read speech generally being more standardized than that of spontaneous speech. This holds particularly for the present experiment, where the text passages read contain a limited number of sentence types (only simple declaratives) and where the content of the text passages was kept neutral (descriptions of a house and a street). So the aim of the present experiment was to determine to what extent listeners are able to identify the geographic origin of speech fragments on the basis of phonetic cues only.

METHOD

The identifiability of four regional Dutch accents was determined. There were four speakers per accent, ranging between 21 and 45 years of age. The speakers had been born and raised in Bedum (in the north-east of the Netherlands), The Hague (west of the Netherlands), Valkenburg (southeast of the Netherlands), and Tiel (midwest of the Dutch-speaking part of Belgium).³ In Figure 1 the places are indicated on a map. Observe that two places coincide with the places investigated in Experiment 1, namely, Bedum and The Hague. The two other places, Valkenburg and Tiel, differ. However, from the point of view of the average Dutchman, the dialects spoken there resemble those spoken in Maastricht and Uitbergen, respectively. Moreover, geographically speaking, they are situated in the same province (Valkenburg and Maastricht in Dutch Limburg) or neighboring provinces (Tiel in West Flanders and Uitbergen in East Flanders). In the subsequent

analyses we will assume the four places in the two experiments to be comparable.

From each speaker a speech fragment of about 45 seconds was presented to the listeners. It consisted of two text passages read aloud, one describing a street, the other a house. The texts were written in standard Dutch (not in dialect) and the speakers, who spoke dialect in their daily functioning, were asked to read them out in standard Dutch as well as they could. The regional accents with which the texts were produced varied from slight to moderately strong.

Twenty-eight students from Nijmegen University participated as listeners, 3 men and 25 women, ages 18 to 26. The listeners came from different parts in the Netherlands, but from Groningen, Limburg, and South Holland, that is, Dutch provinces from which speakers were presented, each time one listener was included. There were no listeners from Belgium. None of the listeners had taken any course in sociolinguistics or dialectology. The speech fragments were presented in two random orders and were preceded by three practice fragments.

Identification was done stepwise by means of a form that was identical to the form used in Experiment 1, except that the response categories "Standard language of the Netherlands" and "Standard language of Belgium" were not included.⁴

RESULTS

There were relatively few missing responses: 0%, 4%, and 5% at the level of country, region, and province, respectively. In the calculation of the number of correct responses, missing responses were counted as incorrect. To compare the identifiability of speech fragments on the basis of just pronunciation (and perhaps a little bit of prosody) with the identifiability of complete speech samples, the results of the present "read" experiment were compared with the results of the "spontaneous" Experiment 1.

The percent of correct identification for the present experiment is presented in Figure 5. To facilitate comparison, the corresponding percentages of Experiment 1 ("integral" version, see Figure 2) are presented as well. Because of the small numbers of speakers, the differences cannot be tested statistically. However, it is clear that more linguistic information on the regional origin of speech fragments does not automatically lead to a higher percentage of correct identification. Whereas the dialects of Bedum and The Hague were indeed identified correctly more often than the corresponding accents, the reverse is the case for Tiel/Uitbergen and, most markedly, Valkenburg/Maastricht. Here, listeners were more successful in determining the origin of the fragments on the basis of just pronunciation (and perhaps some prosody) than on the basis of the full linguistic information, including

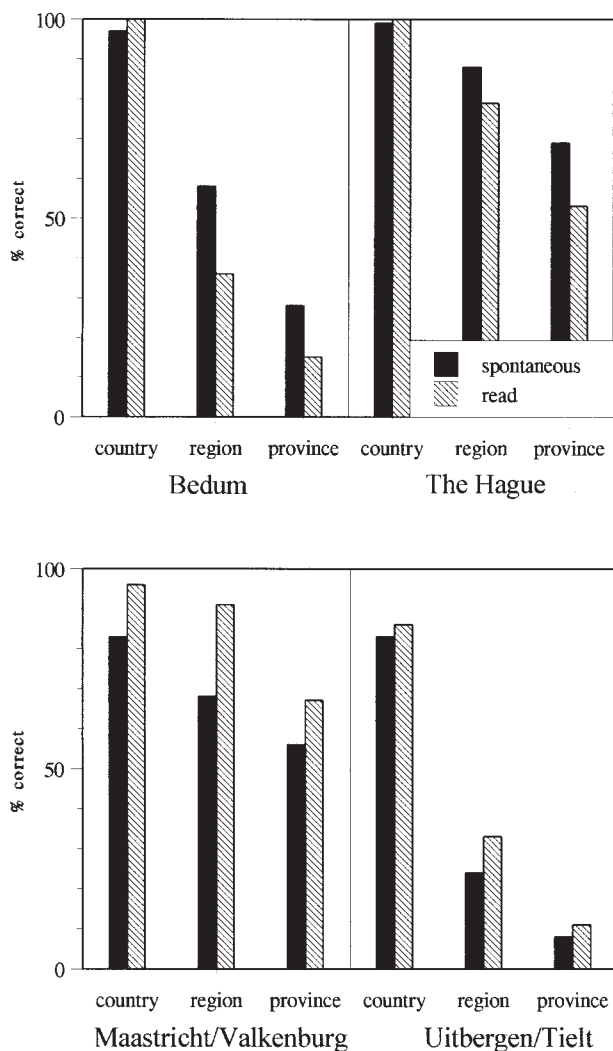


Figure 5. Percentage correct identification of Dutch language varieties: spontaneous versus read speech.

pronunciation and prosody. How can this, somewhat unexpected, outcome be explained?

Let us first look at the two varieties where the spontaneous speech samples led to a higher percentage correct than the read speech samples, that is, The Hague and Bedum. The variety spoken in The Hague is a true *sociolect* or urban dialect: It is strongly lower-class bound and linked to the formality of the communicative situation, broadness increasing as more attention is paid to the content of speech. Moreover,

like most urban dialects, the Hague variety deviates from the standard language almost exclusively at the phonological/phonetic level. This means that the spontaneous speech samples from The Hague presented in the present study contain similar cues as the read speech, but more clearly, both quantitatively and qualitatively. This explains why the spontaneous speech was easier to identify than the read speech, at least at the levels of region and province.

The variety of Bedum is a rural dialect. Bedum is a small community, and speaking the local dialect is determined by autochthony rather than by social class. The Bedum dialect differs from standard Dutch at all linguistic levels. Apparently, the specific region and province of origin of the fragments were fairly difficult to determine on the basis of phonetic cues alone (36% and 15%, respectively). There were two types of confusions: with other Lower-Saxon dialects spoken in other provinces in the northeast of the Netherlands (Drenthe, Overijssel, and part of Gelderland) and with Frisian, which is generally considered a separate language from Dutch and which is spoken in the neighboring province of Friesland, west of Groningen. The percentages correct on the basis of the spontaneous speech samples were 58% and 28% for region and province, respectively, indicating that variation at the "higher" linguistic levels provided extra cues to the listeners that could be meaningfully interpreted to differentiate the Groningen dialect of Bedum from the language varieties mentioned. This shows that dialectologically naive inhabitants of the Netherlands possess relevant knowledge in this respect. It would be interesting to find out where, when, and how this knowledge is acquired.

In contrast, the varieties of Uitbergen/Tielt and, even more clearly, those of Maastricht/Valkenburg were better identified on the basis of phonetic cues alone than on the basis of integral speech fragments, phonetic cues included. This can be interpreted in two ways: Either the phonetic cues stood out more clearly in the read speech fragments or the cues at the other linguistic levels were confusing to the listener. The effect was not very large for the Flemish dialects. It must be realized that people in the Netherlands are hardly ever confronted with local dialects spoken in Belgium. The percentage correct on the basis of the spontaneous speech samples is indeed very low: 24 and 8 for region and province. Flemish accented speech they hear more regularly on the Dutch television or, occasionally, on the Belgian television. This may explain the somewhat better identifiability of the read speech over the spontaneous speech.

For the Maastricht/Valkenburg varieties the advantage of the read over the spontaneous speech is considerable: differences of 13%, 23%, and 11% for country, region, and province. Identifiability on the basis of just phonetic information is high, much higher than for any of the other three varieties. This may have to do with the widely known characteristic of the "soft /g/," which is typical for the Limburg area, and

perhaps also with prosodic characteristics for which the Limburg dialects are known. Apparently, the listeners did not know that these same features characterize the Limburg dialects in Belgium, for few confusions have taken place in this respect. Again it must be assumed that the Limburg phonetic characteristics stood out more clearly in the read speech fragments and/or that lexical, morphosyntactic cues must have confused the listeners in the spontaneous speech samples. Of course, what was mentioned for the Flemish dialects holds for the Limburg dialects as well; people in the Netherlands are confronted much more often with accented speakers, using their approximation of standard Dutch, than with dialect speakers from Limburg, the dialect being spoken exclusively in in-group situations.

CONCLUSION

Except perhaps for the Belgian dialect of Uitbergen for Dutch listeners, the identifiability of Dutch and English varieties appears to be reasonably good when information is provided at all linguistic levels. At the most global level of country, identification exceeded 80% for both languages. At the intermediate level of region, it varied between 24% (Uitbergen) and 88% for the Dutch varieties and between 79% and 97% for the English varieties. And at the most specific level of province/area, it ranged between 8% (Uitbergen) and 69% for the Dutch varieties and between 40% and 67% for the English varieties. In those cases where language attitudes are (mainly) triggered by stereotypes associated with (the speakers of) particular language varieties, there thus seems to be a fair chance that the "correct" stereotypes are triggered, that is, that personality attribution is based on a correct identification of the variety at hand.

The present study furthermore reveals that prosodic features play a minor role in the identification of language varieties, both in the United Kingdom and in the Netherlands. The role of pronunciation varies. In some cases, pronunciation alone leads to better identification than cues at all linguistic levels, including pronunciation. For a social dialect such as the Hague dialect this is readily understandable. However, for rural dialects, further research is needed to gain insight into the precise nature of the processes underlying identification. Especially the role played by single shibboleths deserves further attention.

Insight into the identification process is necessary to complete our understanding of the basis of language attitudes. It should be complemented with research on the role of vocal stereotypes. In fact, attributions may be the result of two "routes." On one hand, one expects attitudes toward specific language varieties to express the stereotypes

held toward (the speakers of) those varieties. Here identification of the variety is a prerequisite. On the other hand, stereotypes may be triggered by specific vocal parameters, independent of the language variety at hand. Until now the relative importance of these two routes in the attribution process—that is, dialect stereotypes, depending on the identification of the language variety, and vocal stereotypes, depending on the identification of speech parameters—has not been systematically investigated within one study, at least not for autochthonous language varieties. A first step in this direction has been taken very recently by Doelemans (1998) for allochthonous accents in the Netherlands.

NOTES

1. The identifiability of the standard languages of the Netherlands and Belgium was investigated as well, but this part of the experiment will not be presented here.
2. Samples of standard English of Britain (RP) were presented as well but will not be discussed here.
3. Samples of the standard languages of the Netherlands, Flanders, and Friesland were included as well but will not be discussed here.
4. As stated earlier, the number of response categories in the two experiments differs in that at the levels of region and province, the “spontaneous” experiment included the two standard languages, whereas the “read” experiment lacked these two categories. However, in practice these two extra categories appeared to have been used by the listeners in not more than 1% of the cases, so that we felt comparison was allowed without prior correction for chance.

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