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English Vowel Pronunciation by Native Speakers of Bunschoten-Spakenburgs Dialect contrasted with Standard Dutch

An Experimental Linguistic Study

Abstract

This paper examines vowel pronunciation in English speech by speakers of Bunschoten-Spakenburgs Dialect (BSD) and compares this with English speech by speakers of Standard Dutch (SD). BSD diverges from SD in several notable ways. These divergences were described by Scholtmeijer (1996). This paper hypothesises that the differences between these two varieties of the Dutch language should also cause correlated differences in the pronunciation of English by speakers of the two varieties. An elicitation task was conducted in which the pronunciation of English by speakers of BSD and speakers of Standard Dutch was recorded and analysed using Praat (Boersma and Weenink 2014). Vowel length, together with the first and second formants (F_1 and F_2), was measured for 18 test items containing /ɑː, ɛ, æ, uː/ and /əʊ/. This led to a number of findings regarding the realised vowels. Younger speakers of BSD produced a closer GOOSE vowel, a more open back version of PALM and GOAT, and a more open vowel in items containing TRAP and DRESS than the young speakers of SD. The adult speakers of BSD realised a more open GOOSE and a closer PALM (joined in some cases by GOAT). While GOOSE showed no direct connection, the realisations of PALM, GOAT, TRAP and DRESS in their respective English contexts exhibited traits similar to those of BSD with regard to vowel length and the formants.

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As I have come to realise over the past few months, one does not simply write a BA thesis on one's own. I would therefore like to take this opportunity to express my gratitude to the people who helped me complete this paper.

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1. Introduction

One of the main questions in the study of second language acquisition is how a speaker's knowledge of his or her first language (L1) influences the comprehension and production of a second language (L2). This widely acknowledged phenomenon is referred to in the study of second language acquisition as *interference*. Meisel (2011) stresses the importance of the study of interference by stating that "interference from L1 was, and in part still is, regarded as the major factor determining the shape of L2 speech" (p. 3). He describes interference as the "influence of one language on another in bilinguals" and explains that this notion is used to refer "to either competence or performance" (p. 3). As defined by Chomsky (1965), competence refers to the system of knowledge that native speakers of a language possess, while performance refers to the way language is used in communication. According to Thomason (2001), interference is a form of contact-induced change (p. 267).

The study of interference has focused on many language contact situations, including contact between Dutch and English. According to Paul, Simons, and Fennig (2013), English is the current de facto lingua franca of the world. Combined with the fact that the Netherlands and the United Kingdom are close neighbours, it is not surprising that much contact exists between Dutch and English. This contact, and especially the interference which it has brought about, has been the subject of numerous studies. However, not much research on this topic has focused on the influence of specific dialects of Dutch. These papers instead focus on Standard Dutch or take variation for granted. In the Netherlands, dialects are widespread and many. Dialect background makes a difference in pronunciation and interference. The difference between some dialects can range from very small to large. This shows the relevance of dialects in the Netherlands, both in general and for the these studies.

In today's globalised society, it is easy to imagine that speakers of dialects come into contact with the English language. For many speakers of Dutch, contact with speakers of English happens often and is the rule rather than the exception. Speakers of Dutch in settings such as an international business or an online video game community come into contact with speakers of English on a daily basis. In educational settings, the English language is introduced to Dutch children when they are around 10-11 years old on average. This is a relatively early age. In fact, the Dutch government are testing the efficiency of completely bilingual primary education (Rijksoverheid Nederland, 2013). In all these processes, interference presumably takes place from Dutch into English.

According to Odlin (2003), interference can occur at any level of language. On the level of phonology, interference studies focus on the influence of the L1 on the realisation of phonemes. Phonologically speaking, dialects are set apart from their respective standard varieties and from each other by differences in feature sets and pronunciation. If this is the case, then it is to be expected that transfer from a Dutch dialect into the English language will also differ from transfer from standard Dutch to English, just as different languages lead to differences in interference. For example, the pronunciation of Dutch by a native speaker of German will differ from that by a native speaker of Dutch. This paper focuses on phonological interference in vowel pronunciation from L1 Bunschoten-Spakenburgs dialect (BSD) into L2 English. BSD is a dialectal variety of Dutch that is spoken in the towns of Bunschoten-Spakenburg and Eemdijk in the province of Utrecht.

A pilot study which was aimed at discovering in which ways phonological interference from L1 BSD differs from phonological interference of L1 Standard Dutch in the pronunciation of vowels in L2 English (Koelewijn 2013) found that speakers of BSD produced longer vowels than speakers of Standard Dutch in test items containing the vowels /ɑː, ɛ, ɑɪ, əʊ/, and /uː/. The study also revealed a contrast in the pronunciation of the English word *arm*. Both speakers of BSD pronounced the test item as [ɛ·m], while the two speakers of Standard Dutch produced the item as [ɑɹm]. The main goal of this study is to further investigate these findings in a bigger experiment using a more elaborate methodology. This leads to a more detailed analysis of the test results. The experiment concerns an elicitation task to investigate realisation of the English vowels /ɑː, ɛ, æ, uː/ and /əʊ/. In contrast with the pilot study, a group of adult participants was added to test for differences in pronunciation that might be due to age differences.

2. Theoretical Framework

2.1 Interference and Transfer

Interference in a linguistic context is often used in combination with the term transfer. However, both terms are subject to ambiguity. Since its coinage by Weinreich (1953), the notion of interference has been used in various ways. The term is described by Thomason (2001) as "[c]ontact-induced change that involves the importation of material and/or structures from one language into another language" (p.267). The term transfer is here defined as the way in which L2 learners "carry over structures from their first language into their version of the second language" (p. 52). A closer look at these definitions reveals only minor differences between them. This shows that the definitions of interference and transfer are not always clearly separated. Meisel (2011), in fact, uses the terms of interference and transfer interchangeably, describing both terms as the "influence of one language on another in bilinguals" (p. 260, 263). However, the idea that the notions of interference and transfer can be used interchangeably is not supported universally. For example, Odlin (1989) states explicitly that "transfer is not simply interference". He views interference as synonymous with the notion of negative transfer, which refers to transfer from the L1 to the interlanguage (IL) that makes the IL less like the target language (TL). Interlanguage is defined as the learner's approximation of the TL, and the TL refers to the language that is being learned. This view is supported by Alberta Learning (2001), which views transfer as the general process mentioned by the likes of Thomason (2001) and Meisel (2011). Alberta Learning (2001) continues by describing the term interference as an erroneous form of this process, or, in other words, negative transfer. Alongside negative transfer, the positive variety exists. Positive transfer makes the learner's IL more like the TL. This occurs when, for example, a certain rule of the L1 is also present in the L2. This leads to the learner having an easier time learning the TL. The definitions given by Odlin (1989) of transfer being the general process and interference being synonymous with negative transfer shall be used for the remainder of this paper.

In a phonological sense, a typical example of interference in the previously mentioned context is the pronunciation of the English lexical item *finger* as [fɪŋə] instead of [fɪŋgə] by Dutch L1 speakers. The Dutch language does not include /g/ in its phoneme inventory, which leads to this non-targetlike pronunciation (Tops, Dekeyser, Devriendt, & Geukens, 2001, p. 4). Shoebottom (2013) mentions the example of word-final voiced consonants, which appear in English but are absent from Dutch. Examples that are given include English words such as *rub* and *bird*, which, in Dutch, are often pronounced as [rʌp] and [bɜːt], with speakers using voiceless consonants to replace their voiced counterparts.

The notion of interference has been studied extensively by many scholars. Many of the studies on interference focus on finding patterns of interference errors for specific language pairs. This is also the case with studies that focus specifically on phonological interference. Studies such as these have also examined the pronunciation of L2 English by L1 speakers of Dutch. For example, Simon (2010) investigates the phonological transfer of Dutch voicing and devoicing rules into English. She found that "there are significant differences in the extent to which (de)voicing processes which were produced with a very high frequency in the native language (L1) are transferred into the second language (L2)". There is thus considerable variation. This study shows that one cannot simply assume that a feature or process which is often produced in the L1 will also be used in the L2.

2.2 Standard Dutch

As was stated before, there have been many studies which focus on phonological interference from L1 Dutch into L2 English. However, most of these studies refer to Dutch as if there is only one Dutch language. However, there are many Dutch dialects. This is the same for English. There are many descriptions of the dozens of varieties of English that exist in the world, such as Melchers and Shaw (2011). Dutch differs from English in many respects. For example, Dutch is by no means a global lingua franca. However, the many varieties of Dutch are at least as diverse as the varieties of English. This leads to the conclusion that, instead of speaking of a single hegemonic Dutch language, the term Dutch should be defined as an umbrella term under which the various dialects of the Dutch language come together.

One can only assume that the aforementioned studies refer to Standard Dutch. One of the key studies on the notion of Standard Dutch is Smakman (2006). Smakman combines various methods to investigate, among other things, what the definition of Standard Dutch in the Netherlands entails, and to what degree people agree on this definition. He finds that Standard Dutch does indeed exist. It does not only exist in the literature, where, according to Smakman, "various writers have directly indicated that in some shape or form Standard Dutch is real" (p. 275). He also argues that it exists in Dutch society, as the participants in his experiment "were generally able to describe it" (p. 277). Moreover, "[t]hese descriptions", Smakman elaborates, "even revealed considerable agreement" (p. 277). The participants in his experiment indicated that "[p]ronunciation in particular plays a role in degree of standardness" (p. 284), highlighting the importance of pronunciation.

For vowels, Smakman (2006) measured the “fundamental frequency (F_0) and three formants (F_1 through F_3)” (p. 253) for a number of vowels. Smakman (2006) includes a table (reproduced here as Figure 1) which shows the averages of F_1 and F_2 for his male speakers. Smakman includes, among others, (oe), (oo) and (a), the spelling conventions for the Dutch vowels /uː, oː/ and /ɑ/. The current study also investigates these vowels. Since the current study uses speakers of SD as reference point to measure the differences in the English speech by speakers of BSD, it is important that our SD groups’ formant measurements correspond as much as possible to Smakman’s (2006) results. The table in Smakman (2006) is shown in Figure 1 below.

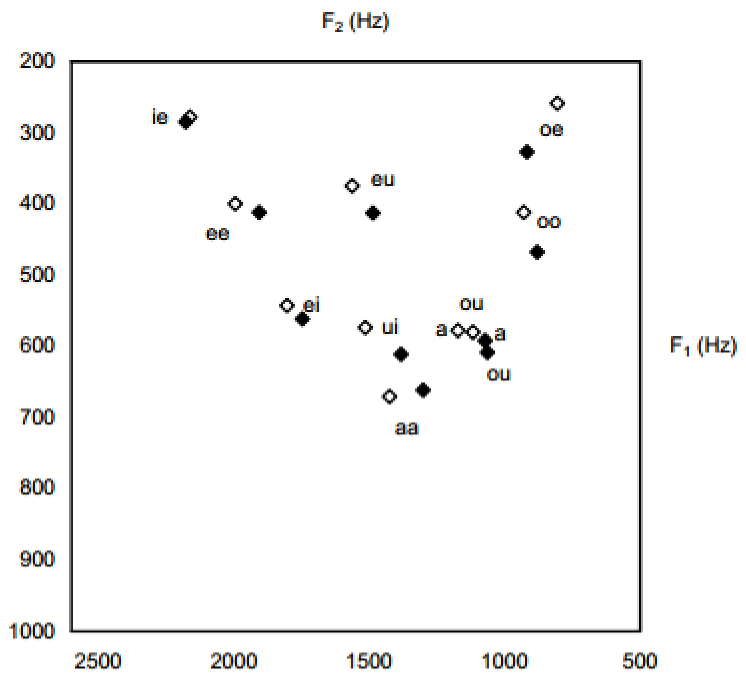

Figure 1: Smakman shows “F_1 and F_2 (Hz) at 50% of four peripheral and six focal vowels of Adank et al.’s (2004) male speakers” and “[his] male speakers” (2006). The opaque squares are Smakman’s (2006).

It should be noted that the features described here are by far not the total number of features that Smakman (2006) provides as characteristics of SD. However, they are the ones most relevant to the current study.

2.3 Bunschoten-Spakenburgs Dialect

This study focuses on Bunschoten-Spakenburgs Dialect (BSD), a dialect of Dutch spoken in Bunschoten-Spakenburg and the nearby town of Eemdijk in the Dutch province of Utrecht. BSD differs from Standard Dutch (SD) in more than just the phonological domain. The dialect contains many lexical items which do not occur in SD. Examples of these items are shown below[1].

BSD	SD	English
1. s*julekrupen*	*verstoppertje spelen*	*playing hide-and-seek*
2. *afferpinnetjie*	*bagagedrager*	*(luggage) carrier*

In addition to these lexical deviations, BSD also differs from SD on a morphological level. An example of this is the diminutive suffix *–etje* in Standard Dutch, (for instance in *mannetje*), is*–etsie* or *etjie* in BSD: SD *mannetje* becomes *mannetsie* or *mannetjie* in BSD. This is just one of many examples of morphological variation from SD in BSD[2].

From a phonological perspective, there are also many deviations that set BSD apart from SD. Scholtmeijer (1996) lists eight deviations from SD which characterise BSD:

1. /ɑ/ is realised as [ɑˑ]. It is important to note that Scholtmeijer bases his information on Blancquaert and Pee's *Reeks Nederlandse Dialectatlassen*, which indeed notes /ɑˑ/. However, Scholtmeijer (1996) uses the Dutch word *achter* "behind" as an example (p. 176). This word, which is produced with [ɑ] in SD, is pronounced with a vowel that approximates /aː/ rather than /ɑˑ/ in BSD in the author's personal experience. Also, Scholtmeijer gives (aa) in spelling as the resulting vowel, which suggests the use of /aː/ as well. It should also be noted that in the author's personal experience, the stretching effect that Scholtmeijer (1996) describes pertains to multiple vowels including /ɛ/.

[1] Given examples are from the author's personal experience.
[2] Given examples are from the author's personal experience.

2. /aː/ becomes [ɔː]. Scholtmeijer (1996) uses (aa) and (ao) to render this difference in spelling. This affects the vowel in Dutch words such as *jaar* “year” and *laten* “to let”.
3. Un-diphthongised pronunciation of /ɛi/ and /œy/. Rather than /ɛi/ and /œy/, speakers of BSD produce [i] and [y].
4. /sx/ becomes [ʃ] in word-initial position. For example, the Dutch word *schaap* is produced as [ʃɔːp] in BSD (the vowel changes according to Scholtmeijer’s second feature deviation).
5. /oː/ becomes [uː]: an example of this is the Dutch word *honing*, which is pronounced [huːnəŋ] in BSD.
6. Umlaut (fronting) of the long vowels: in many words, the vowels /oː/ and /uː/ are realised as [øː]. Dutch words such as *goot* and *groen* are respectively pronounced as [gøːt] and [xʀøːn] in BSD.
7. Rounding of /ɛi/ to [y] between labial consonants. For example, Dutch *pijp* is produced as [pyp].
8. /n/-velarisation: Scholtenmeijer explains that the nasal consonant /n/ is often produced as [ŋ]. This mostly happens in combination with a dental consonant, but this is not always the case. Scholtmeijer uses the rather humorous example *ming brunge kning*, which is BSD for *mijn bruine konijn* (SD) or “my brown rabbit”. He also gives *hongd* (in spelling) for the Dutch word *hond* “dog”.

Specific pronunciation transcriptions can be found in Blancquaert and Pée’s *Reeks Nederlandse Dialectatlassen*, in which BSD is listed as Spakenburgs as entry F121.

2.4 Pilot Results

The differences between SD and BSD, which were summarised by Scholtmeijer (1996), were used in the pilot study to investigate whether interference from BSD into English differed from interference from SD into English. As in the current study, the focus was on vowels. Therefore, features four and eight were not tested for. The pilot study tested the pronunciation of the test items "vast", "task", "arm", "baths", "bike", "night-time", "bones", "bloke", "boom box", and "cartoon". The pilot study mainly uncovered a vowel length contrast between speakers of BSD and speakers of SD. A particularly interesting finding was that both speakers of BSD pronounced the test item "arm" as [ɛˑm]. However, vowel length was measured by ear, and no formant measurements were made. It was therefore decided that more research was necessary to further investigate the pilot's findings.

3. Method

To investigate the length contrast and any further manifestations of the pronunciation of /ɑː/ as [ɛ], an experiment was conducted in which the English speech of 12 subjects was recorded. The data were subsequently analysed using Praat (Boersma and Weenink 2014).

3.1 Participants

Compared to the pilot study, the number of participants was increased. The total number of participants for the experiment was 12. All participants for the current experiment were male. This was decided to ensure that the results would be comparable across the subgroups. Half of the participants were 13 years old. The other six participants were between the ages of 27 and 50 years old, with an average of 44. This adult group was added to investigate whether the results change with age. Both age groups consisted of two subgroups. Subgroup 1BSD consisted of three participants from Bunschoten-Spakenburg. All three of these subjects were students enrolled in the *Oostwende College* in Bunschoten-Spakenburg, a secondary school, where they all had multiple obligatory English classes per week. The subjects in this group were selected out of a group of six students of the *Oostwende College* on the basis of a questionnaire that is discussed in section 3.2. Subgroup 1SD consisted of three male participants aged 13 years old from Amersfoort. All subjects in this group had multiple obligatory English classes per week at their respective schools. These subjects were contacted through the researcher's personal network. The participants in this group were selected on the basis of the likeness of their speech to Standard Dutch as it is described by Smakman (2006).

The adult age group was also divided into two subgroups. Subgroup 2BSD consisted of three adult male speakers of BSD. All subjects were inhabitants of Bunschoten-Spakenburg. Subgroup 2SD consisted of three adult male inhabitants of Amersfoort. Again, these speakers were selected on the basis of the close correspondences between their speech and Standard Dutch as described by Smakman (2006). All subjects in subgroups 2BSD and 2SD were contacted through the researcher's personal network.

3.2 Questionnaire

As in the pilot study, all participants completed a questionnaire to ensure that they were part of the target groups for the experiment. Two different questionnaires were used. The first questionnaire was given to the subjects in subgroups 1BSD and 1SD. This questionnaire contained several multiple-choice questions which were to be answered by circling 'yes', 'no', or both options to answer 'sometimes'. Participants were asked whether they spoke the vernacular (referring to BSD) at home, at school, and among friends. In addition, the questionnaire contained questions about whether the subjects' parents spoke the dialect. Lastly, the questionnaire contained an open question about whether or not the subjects could name a situation in which they would rather not speak dialect. Subjects were aware of the fact that answering in a negative fashion was allowed.

A second questionnaire was used for the adult subgroups 2BSD and 2SD. The question about dialectal speech at school and the questions about whether or not the subjects' father and mother spoke dialect were removed. A question about dialectal speech at work was added instead.

All questions on the questionnaires were written in Dutch for purposes of clarity. It is also important to note that, in contrast with the pilot study, the questionnaires were handed to the participants after their speech had been recorded. Subjects were not made aware of the fact that the research was focused on dialectal speech until after the recordings were made, to minimise any possibility that the participants would alter their speech. The actual questionnaires are included as appendices A and B to give an impression of how the questions were phrased in Dutch.

3.3 Experiment

As was the case with the pilot study, the experiment consisted of an elicitation task, in which the participants were asked to read out loud a sequence of sentences that was presented to them on paper. The text was presented on paper to ensure that the participants were not influenced by the researcher's own pronunciation. Elicited speech is often referred to as unnatural or at least less natural than spontaneous speech. However, in spite of this disadvantage, the researchers still chose an elicitation approach because the fact that the target vowels were highly specific. It would have been much more difficult to guide the subjects' speech towards the specific vowels. Spontaneous speech would have taken too much time to gather, with the possibility that the subjects would not produce the target vowels in any way within the limited time frame.

As the target vowels for this study were decided on as PALM, DRESS, TRAP, GOOSE and GOAT, these were the vowels that were tested for in the experiment. For each of the vowels, three test items were produced. Some of these test items, such as *cartoon* and *task*, were directly taken from the pilot study. The other test items were not chosen for a specific trait other than the fact that they contained the target vowel. It is important to note that the vowels in the test items are in some cases influenced by their surrounding consonants. A vowel that is followed by a plosive will be realised in a shorter fashion than a vowel that is, for example, followed by a nasal consonant. However, since no direct comparisons are made between the test items themselves, this does not influence the results. This study only compares the four subgroups. To further investigate the pronunciation of *arm* as [ɛˑm] by the test group in the pilot study, three more test items were produced for the PALM vowel. One of these was the test item *arm* itself, while two others replicated the phonological context in which PALM exists in *arm*. As some of the test items in the pilot study turned out to cause difficulty for most of that study's participants, it was decided to use somewhat simpler test items for this study. The test items per vowel are shown below, followed, for reference purposes, by a transcription in the Received Pronunciation accent:

- PALM
    - *palm* /pʰɑːm/
    - *task* /tʰɑːsk/
    - *past* /pʰɑːst/
- DRESS
    - *dress* /dɹɛs/
    - *pest* /pʰɛst/
    - *left* /lɛft/
- TRAP
    - *cat* /kʰæt/
    - *gap* /gæp/
    - *backpack* /bækpæk/

- GOOSE

    - *cartoon* /kʰɑːtuːn/
    - *goose* /guːs/
    - *zoom* /zuːm/

- GOAT

    - *stone* /stəʊn/
    - *phone* /fəʊn/
    - *bone* /bəʊn/

The test items to investigate the realisation of /ɑ/ as [ɛ˙] in *arm* in Koelewijn (2013) were the following:

- PALM

    - *arm* /ɑːm/
    - *farm* /fɑːm/
    - *car* /kɑː/

Koelewijn (2013) used a small text for its experiment. For the current study, it was decided to use a single carrier phrase to accommodate every test item. This was done to eliminate any influence that the non-test items in the text might have on the pronunciation of the test items. Also, to eliminate any end-of-sentence effects such as creaky voice, lowering of intensity and intonation issues, the test sentence was constructed to have three syllables after the occurrence of the test item. The test sentence that was used in the experiment is as follows:

I will say ____ one more time.

Subjects were asked to read out a total of 18 sentences which each contained one of the previously mentioned test items. The full list was presented to the participants on paper. This paper is included as appendix C.

The participants' speech was recorded in a closed-off room to avoid noise. These recordings were analysed using Praat (Boersma and Weenink 2014).

4. Results

In this section, the results of the experiment are presented. The recorded data was analysed, and the vowel length, first formant (F_1), and second formant (F_2) were measured for each of the 18 test items. These two formants determine the open/close and front/back dimensions, and thus the realised pronunciation of the vowel. For the test item *backpack*, both vowels were analysed. Various averages were then calculated, which will be discussed further on in this section.

4.1 Vowel Production and Exceptions

In section 3.3 the test items were shown per vowel. However, the vowels that were used to categorise the test items were the vowels as they would be in British English. Following the definition of interference, and since the speakers in the experiment are L2 speakers of English, the IL that the participants produced was often influenced by their L1, either Standard Dutch or Bunschoten-Spakenburgs Dialect. For example, the test items that contained the English TRAP vowel were all realised by our test subjects with [ɛ] instead of [æ]. This is in line with claims by Collins and Mees (1984), who state that TRAP, due to its absence in the phonetic system of Dutch, is mostly realised as [ɛ] by native speakers of Dutch. In most cases, the participants' realisation of the vowels was in line with our expectations. However, several statistical outliers, which distorted the averages in an unacceptable manner, were marked as unwanted deviations by the author, and were therefore omitted from the calculations of the average values. In subgroup 1SD, one of the participants produced *gap* as [xɑp]. This is a typically Dutch pronunciation of orthographic *g* and *a*. It did not match the pronunciation of any of the other participants. Another participant in subgroup 1SD pronounced *bone* with a slight hesitation, resulting in a vowel that lands somewhere between GOAT and GOOSE. This yielded strongly divergent outputs from the rest of the group, which produced the expected GOAT. The same subject produced *past* with a slightly elongated DRESS vowel, reminiscent of American English. A single participant of subgroup 2SD realised *task* with the same slightly elongated DRESS. There was no participant in subgroups 1BSD or 2BSD that produced this same vowel (all native speakers of BSD opted for PALM in *past* and *task*). For this reason, the measurements for these particular combinations were omitted from the results. All speakers in subgroup 1SD, joined by one participant in both subgroups 2SD and 2BSD, used the Dutch vowel /oː/[3] in their realisations of *goose*. Regardless of the fact that this is quite extraordinary, this outlier interfered with the average measurements, and was therefore omitted. The item *cartoon* also yielded several outliers. One subject in subgroup 1BSD, two subjects in subgroup 2SD, and one subject in subgroup 2BSD misplaced stress in this test item. This yielded relatively short vowels. These pronunciations were therefore also treated as statistical outliers. A participant in subgroup 2SD mispronounced farm, resulting in an abnormal elongation of the vowel. This speaker's realisation was therefore also taken out. A subject in subgroup 2BSD used [ɛɪ] to pronounce *gap*. Praat (Boersma and Weenink 2014) unfortunately did not measure correct values for this subject's realisations of *arm* and *zoom*. Another participant of subgroup 2BSD raised his pitch in the final test item *left*. These pronunciations yielded incorrect measurements, which were omitted from further calculations and results.

4.2 Vowel Length

For all participants, the length of the vowels in the test items was measured via Praat. An average vowel length (mean) was then calculated per group. The average vowel length in milliseconds (ms) for subgroups 1SD and 1BSD is shown in Tables 1 and 2 below.

[3] This could, of course, also be the subjects' best attempt at the GOAT vowel. Unfortunately, this could not be clarified in the experiment, as the subjects did not possess the linguistic knowledge needed to discuss this issue with them.

1SD average vowel length in ms.	
Cartoon (GOOSE)	122
Zoom (GOOSE)	232
Goose (GOAT)	206
Past (PALM)	136
Palm (PALM)	191
Task (PALM)	141
Arm (PALM)	220
Car (PALM)	215
Farm (PALM)	188
Bone (GOAT)	151
Stone (GOAT)	228
Phone (GOAT)	187
Gap (DRESS)	143
Backpack1 (DRESS)	98
Backpack2 (DRESS)	122
Cat (DRESS)	129
Dress (DRESS)	162
Pest (DRESS)	138
Left (DRESS)	127
Average GOOSE	177
Average PALM	182
Average GOAT	189
Average DRESS	131

1BSD average vowel length in ms.	
Cartoon (GOOSE)	175
Zoom (GOOSE)	206
Goose (GOOSE)	253
Past (PALM)	215
Palm (PALM)	229
Task (PALM)	231
Arm (PALM)	203
Car (PALM)	239
Farm (PALM)	204
Bone (GOAT)	216
Stone (GOAT)	207
Phone (GOAT)	199
Gap (DRESS)	204
Backpack1 (DRESS)	112
Backpack2 (DRESS)	154
Cat (DRESS)	189
Dress (DRESS)	164
Pest (DRESS)	176
Left (DRESS)	145
Average GOOSE	211
Average PALM	220
Average GOAT	207
Average DRESS	163

Tables 1 and 2: average vowel length in milliseconds for subgroups 1SD and 1BSD. The left column shows the test item, followed by the produced vowel in parentheses.

It is important to note the realisation of *goose* with the GOAT vowel by subgroup 1SD. Since all participants in this subgroup used this vowel, the averages cannot be compared to the realisation of *goose* by subgroup 1BSD. Of the 18 remaining vowels that were measured, only three instances occur in which the vowel length of subgroup 1SD is longer than the vowel length of subgroup 1BSD; this occurred with the test items *arm*, *stone*, and *zoom*. In all other cases, subgroup 1BSD produced longer vowels than subgroup 1SD.

The average vowel length for subgroups 2SD and 2BSD was calculated using the same method. The average vowel length for subgroups 2SD and 2BSD is shown in Tables 3 and 4 below.

2SD average vowel length in ms.	
Cartoon (GOOSE)	188
Zoom (GOOSE)	166
Goose (GOOSE)	197
Past (PALM)	163
Palm (PALM)	178
Task (PALM)	171
Arm (PALM)	176
Car (PALM)	182
Farm (PALM)	146
Bone (GOAT)	170
Stone (GOAT)	171
Phone (GOAT)	168
Gap (DRESS)	134
Backpack1 (DRESS)	91
Backpack2 (DRESS)	103
Cat (DRESS)	95
Dress (DRESS)	117
Pest (DRESS)	116
Left (DRESS)	101
Average GOOSE	184
Average PALM	169
Average GOAT	170
Average DRESS	108

2BSD average vowel length in ms.	
Cartoon (GOOSE)	149
Zoom (GOOSE)	222
Goose (GOOSE)	225
Past (PALM)	215
Palm (PALM)	196
Task (PALM)	221
Arm (PALM)	217
Car (PALM)	206
Farm (PALM)	188
Bone (GOAT)	210
Stone (GOAT)	171
Phone (GOAT)	156
Gap (DRESS)	142
Backpack1 (DRESS)	91
Backpack2 (DRESS)	111
Cat (DRESS)	106
Dress (DRESS)	112
Pest (DRESS)	115
Left (DRESS)	92
Average GOOSE	199
Average PALM	207
Average GOAT	179
Average DRESS	110

Tables 3 and 4: average vowel length in milliseconds for subgroups 2SD and 2BSD. The left column shows the test item, followed by the produced vowel in parentheses.

The difference in vowel length seems to be somewhat less clearly pronounced than was the case with subgroups 1SD and 1BSD. The vowels in test items *cartoon* (although it must be noted that two out of three measurements for this test item were unusable for subgroup 2SD), *dress*, *phone*, and *left*, were given more length by subgroup 2SD. Test items *stone*, *pest*, and the first vowel in *backpack* were pronounced with the same length (in the case of *pest*, there was a difference of one millisecond, which can, at this scale, hardly be called a difference at all). This still leaves twelve test items for which subgroup 2BSD produced a longer vowel than subgroup 2SD.

There are, of course, differences between these averages that are so small that they might be deemed insubstantial and therefore irrelevant. It was decided to mark a difference as relevant if the longer vowel was at least 20 per cent longer than its shorter counterpart. This leaves us the following relevant relative differences.

Percentual differences 1SD/1BSD.		
Cartoon (GOOSE)	43.44%	BSD
Past (PALM)	58.08%	BSD
Task (PALM)	63.83%	BSD
Bone (GOAT)	43.04%	BSD
Gap (DRESS)	42.66%	BSD
Backpack2 (DRESS)	26.23%	BSD
Cat (DRESS)	46.51%	BSD
Pest (DRESS)	27.54%	BSD

Percentual differences 2SD/2BSD		
Cartoon (GOOSE)	26.17%	SD
Zoom (GOOSE)	33.73%	BSD
Past (PALM)	31.90%	BSD
Arm (PALM)	23.30%	BSD
Task (PALM)	29.24%	BSD
Farm (PALM)	28.77%	BSD
Bone (GOAT)	23.53%	BSD

Tables 5 and 6: relative differences in the pronunciation of vowels for subgroups 1BSD/1SD (left) and 2BSD/2SD (right). Only those test items which were produced with a difference of 20 per cent or more are relevant and shown here. The test item (with the produced vowel in parentheses) is followed by the relative difference percentage between the groups. The rightmost column in both figures displays the language variety (Bunschoten Spakenburgs Dialect or Standard Dutch) of which its speakers produced the longer vowel.

4.3 First Formant

The first formant (F_1) was measured in hertz (Hz) for all participants. The F_1 was mostly measured at 50 per cent of the vowel length as measured with Praat (Boersma and Weenink 2014). In some cases, the measurement was taken at a different point if there was no clear measurement possible at the 50% mark. Using these measurements, the average F_1 was measured for each item for each of the subgroups. The F_1 is the acoustic correlate of the open/close dimension of the vowel. It is important to note that, in line with Collins and Mees (1984), items that contain the TRAP vowel in British English were realised by all participants in all subgroups with the DRESS vowel. This also shows in the formant measurements. The average F_1 for subgroups 1SD and 1BSD is shown in Tables 7 and 8 below.

1SD average F_1 in Hz.	
Cartoon (GOOSE)	408
Zoom (GOOSE)	424
Goose (GOAT)	497
Past (PALM)	582
Palm (PALM)	595
Task (PALM)	637
Arm (PALM)	637
Car (PALM)	660
Farm (PALM)	587
Bone (GOAT)	510
Stone (GOAT)	479
Phone (GOAT)	513
Gap (DRESS)	559
Backpack1 (DRESS)	559
Backpack2 (DRESS)	633
Cat (DRESS)	552
Dress (DRESS)	538
Pest (DRESS)	568
Left (DRESS)	595
Average GOOSE	416
Average PALM	616
Average GOAT	501
Average DRESS	572

1BSD average F_1 in Hz.	
Cartoon (GOOSE)	352
Zoom (GOOSE)	337
Goose (GOOSE)	315
Past (PALM)	800
Palm (PALM)	740
Task (PALM)	793
Arm (PALM)	810
Car (PALM)	788
Farm (PALM)	712
Bone (GOAT)	556
Stone (GOAT)	638
Phone (GOAT)	577
Gap (DRESS)	711
Backpack1 (DRESS)	691
Backpack2 (DRESS)	690
Cat (DRESS)	745
Dress (DRESS)	720
Pest (DRESS)	780
Left (DRESS)	732
Average GOOSE	335
Average PALM	774
Average GOAT	590
Average DRESS	724

Tables 7 and 8: average F_1 in hertz for subgroups 1SD and 1BSD. The left column shows the test item, followed by the produced vowel in parentheses.

Again, it is important to note that since the participants in subgroup 1SD all used the GOAT vowel in their pronunciation of *goose*, this item cannot be the subject of comparison. For test items *cartoon* and *zoom*, the average F_1 is lower for subgroup 1BSD than for subgroup 1SD. These test items both contain the GOOSE vowel. For all other test items, the average F_1 is located at a higher frequency for subgroup 1BSD than for subgroup 1SD. This points towards structural differences between the young speakers of BSD and the young speakers of SD in the pronunciation of the vowels. As was the case with the vowel length measurements, it was decided to make a division between substantial and insubstantial differences. The boundary for a difference to be relevant was set at 50 Hz. For the differences between subgroup 1SD and 1BSD, this means that the results for the test item *bone* (a difference of 44 Hz) are deemed insubstantial. The remaining results are all relevant.

The average F_1 in hertz for subgroups 2SD and 2BSD is shown in Tables 9 and 10 below.

2SD average F_1 in Hz.	
Cartoon (GOOSE)	295
Zoom (GOOSE)	291
Goose (GOOSE)	282
Past (PALM)	584
Palm (PALM)	552
Task (PALM)	575
Arm (PALM)	603
Car (PALM)	586
Farm (PALM)	569
Bone (GOAT)	477
Stone (GOAT)	422
Phone (GOAT)	501
Gap (DRESS)	446
Backpack1 (DRESS)	487
Backpack2 (DRESS)	501
Cat (DRESS)	455
Dress (DRESS)	474
Pest (DRESS)	479
Left (DRESS)	489
Average GOOSE	289
Average PALM	578
Average GOAT	467
Average DRESS	476

2BSD average F_1 in Hz.	
Cartoon (GOOSE)	330
Zoom (GOOSE)	324
Goose (GOOSE)	417
Past (PALM)	631
Palm (PALM)	543
Task (PALM)	616
Arm (PALM)	644
Car (PALM)	657
Farm (PALM)	598
Bone (GOAT)	450
Stone (GOAT)	495
Phone (GOAT)	476
Gap (DRESS)	465
Backpack1 (DRESS)	482
Backpack2 (DRESS)	526
Cat (DRESS)	482
Dress (DRESS)	518
Pest (DRESS)	472
Left (DRESS)	490
Average GOOSE	357
Average PALM	615
Average GOAT	474
Average DRESS	491

Tables 9 and 10: average F_1 in hertz for subgroups 2SD and 2BSD. The left column shows the test item, followed by the produced vowel in parentheses.

As with the vowel length, which was discussed in section 4.2, the difference between the average F_1's is less clearly observable in the adult subgroups than in the younger subgroups. For the test items *bone*, *palm*, *pest*, *phone*, and the first vowel in *backpack*, the average F_1 is lower for subgroup 2BSD than for subgroup 2SD. The test item *left* was realised with the same F_1 by both subgroups (a difference of 1 millisecond between both averages). In the other

13 cases, the F_1 was higher for subgroup 2BSD than for subgroup 2SD. As with subgroups 1SD and 1BSD, the division between substantial and insubstantial results was made using the same boundary of 50 Hz. However, in sharp contrast with subgroups 1SD and 1BSD, the only substantial differences between subgroups 2SD and 2BSD are found in the test items *goose* (135 Hz), *stone* (73 Hz), and *car* (71 Hz). The remaining 16 test items all showed a difference of less than 50 Hz and were therefore treated as insubstantial. This leaves us with the following relevant results.

Differences in Hz for 1SD/1BSD		
Cartoon (GOOSE)	56	SD
Zoom (GOOSE)	87	SD
Past (PALM)	218	BSD
Arm (PALM)	173	BSD
Palm (PALM)	145	BSD
Car (PALM)	128	BSD
Task (PALM)	156	BSD
Farm (PALM)	125	BSD
Stone (GOAT)	159	BSD
Phone (GOAT)	64	BSD
Gap (DRESS)	152	BSD
Dress (DRESS)	182	BSD
Backpack1 (DRESS)	132	BSD
Backpack2 (DRESS)	57	BSD
Cat (DRESS)	193	BSD
Pest (DRESS)	212	BSD
Left (DRESS)	137	BSD

Differences in Hz for 2SD/2BSD		
Goose (GOOSE)	135	BSD
Car (PALM)	71	BSD
Stone (GOAT)	73	BSD

Tables 11 and 12: relevant differences between F_1 in Hz for subgroups 1SD/1BSD and 2SD/2BSD. A difference is relevant if it is at least 50 Hz. The test item (with the produced vowel in parentheses) is followed by the difference in Hz. The rightmost columns contain information about which language variety (Bunschoten-Spakenburgs Dialect or Standard Dutch) produced the highest F_1.

4.4 Second Formant

In addition to the vowel length and F_1, the second formant (F_2) was measured in hertz for all participants. The F_2 was mostly measured at the same point as the F_1. However, the measurement was sometimes taken at a different point if there was no clear measurement possible at the 50% mark. The F_2 is the acoustic correlate of the front/back dimension of the vowel. To account for the influence of F_1 in F_2, a measure of F_2-F_1 was used. This also provides a basic normalisation, making the measurements more speaker-independent. This was done by subtracting F_1 from F_2. Again, it is important to note that all items that contain the TRAP vowel in British English were produced using the DRESS vowel by all participants in all subgroups. The average (normalised) F_2 for subgroups 1SD and 1BSD is shown in Tables 13 and 14 below.

1SD average F_2 in Hz.	
Cartoon (GOOSE)	708
Zoom (GOOSE)	748
Goose (GOAT)	732
Past (PALM)	672
Palm (PALM)	392
Task (PALM)	710
Arm (PALM)	567
Car (PALM)	566
Farm (PALM)	565
Bone (GOAT)	619
Stone (GOAT)	763
Phone (GOAT)	645
Gap (DRESS)	1483
Backpack1 (DRESS)	1362
Backpack2 (DRESS)	1349
Cat (DRESS)	1480
Dress (DRESS)	1404
Pest (DRESS)	1284
Left (DRESS)	1308
Average GOOSE	728
Average PALM	579
Average GOAT	676
Average DRESS	1381

1BSD average F_2 in Hz.	
Cartoon (GOOSE)	629
Zoom (GOOSE)	687
Goose (GOOSE)	693
Past (PALM)	399
Palm (PALM)	315
Task (PALM)	446
Arm (PALM)	299
Car (PALM)	409
Farm (PALM)	386
Bone (GOAT)	481
Stone (GOAT)	499
Phone (GOAT)	503
Gap (DRESS)	1439
Backpack1 (DRESS)	1393
Backpack2 (DRESS)	1378
Cat (DRESS)	1422
Dress (DRESS)	1379
Pest (DRESS)	1253
Left (DRESS)	1296
Average GOOSE	670
Average PALM	376
Average GOAT	494
Average DRESS	1366

Tables 13 and 14: average F_2-F_1 in hertz for subgroups 1SD and 1BSD. The left column shows the test item, followed by the produced vowel in parentheses.

The frequency of the average F_2- F_1 was higher for subgroup 1SD in all test items except for both vowels in *backpack*. The highest difference was 273 Hz in the test item *past*.

The average F_2-F_1 in hertz for subgroups 2SD and 2BSD is shown in Tables 15 and 16 below.

2SD average F_2 in Hz.	
Cartoon (GOOSE)	641
Zoom (GOOSE)	688
Goose (GOOSE)	527
Past (PALM)	673
Palm (PALM)	320
Task (PALM)	414
Arm (PALM)	535
Car (PALM)	485
Farm (PALM)	331
Bone (GOAT)	472
Stone (GOAT)	609
Phone (GOAT)	377
Gap (DRESS)	1388
Backpack1 (DRESS)	1295
Backpack2 (DRESS)	1221
Cat (DRESS)	1345
Dress (DRESS)	1169
Pest (DRESS)	1238
Left (DRESS)	1171
Average GOOSE	619
Average PALM	460
Average GOAT	486
Average DRESS	1261

2BSD average F_2 in Hz.	
Cartoon (GOOSE)	695
Zoom (GOOSE)	608
Goose (GOOSE)	579
Past (PALM)	337
Palm (PALM)	304
Task (PALM)	420
Arm (PALM)	308
Car (PALM)	384
Farm (PALM)	335
Bone (GOAT)	430
Stone (GOAT)	509
Phone (GOAT)	438
Gap (DRESS)	1435
Backpack1 (DRESS)	1339
Backpack2 (DRESS)	1304
Cat (DRESS)	1371
Dress (DRESS)	1085
Pest (DRESS)	1161
Left (DRESS)	1120
Average GOOSE	627
Average PALM	348
Average GOAT	459
Average DRESS	1259

Tables 15 and 16: average (normalised) F_2-F_1 in hertz for subgroups 2SD and 2BSD. The left column shows the test item, followed by the produced vowel in parentheses.

The vowels in the test items *past*, *bone*, *arm*, *dress*, *palm*, *stone*, *car*, *zoom*, *pest*, and *left* were produced with a higher F_2 by subgroup 2SD. In the remaining test items, the F_2 in the speech production of subgroup 2SD was higher than that of subgroup 2BSD.

As with the measurements for vowel length and F_1, a division was made between relevant and irrelevant results. Taking into account the fact that the F_2 can be more varied among people, the boundary between substantial and insubstantial differences was set at 100 Hz (for the F_2-F_1 measurements). This yields the following relevant differences for the F_2.

Differences in Hz for 1SD/1BSD		
Past (PALM)	273	SD
Arm (PALM)	268	SD
Car (PALM)	157	SD
Task (PALM)	264	SD
Farm (PALM)	179	SD
Bone (GOAT)	183	SD
Stone (GOAT)	264	SD
Phone (GOAT)	142	SD

Differences in Hz for 2SD/2BSD		
Past (PALM)	336	SD
Arm (PALM)	227	SD
Car (PALM)	101	SD
Stone (GOAT)	100	SD

Tables 17 and 18: relevant differences between F_2 in Hz for subgroups 1SD/1BSD and 2SD/2BSD. A difference is relevant if it is at least 100 Hz. The test item (with the produced vowel in parentheses) is followed by the difference in Hz. The rightmost columns contain information about which language variety (Bunschoten-Spakenburgs Dialect or Standard Dutch) produced the highest F_2.

5. Discussion

5.1 Vowel length

The first objective of this experiment was to investigate vowel length. As can be deduced from section 4.2, there are discernable differences in vowel length between the subgroups. In eight of the 18 observable cases (due to the pronunciation differences in the test item *goose*), subgroup 1BSD produced a vowel that was more than 20 per cent longer than the vowel produced by subgroup 1SD. None of the test items were produced with substantially longer vowels by subgroup 1SD. In another ten cases, there was no relevant difference. In subgroups 2SD and 2BSD, there were seven cases in which there was a substantial length difference. Subgroup 2BSD produced substantially longer vowels in six instances, while subgroup 2SD produced only one substantially longer vowel. In the remaining cases, there was no noticeable difference in vowel length. It should be noted that the test item *pest* also occurs in the vocabulary of Dutch, and that *backpack* is a loanword for some native speakers of Dutch. However, as can be seen in the tables in the previous chapter, this did not influence the realisations of both test items.

Something that draws attention regarding the younger speaker groups is the fact that in three test items which are normally produced with the TRAP vowel by native speakers, the vowel that is realised by the speakers of BSD is substantially longer. Also, in *past* and *task*, two items that contain the PALM vowel in British English, the vowel that is produced by the speakers of BSD is over 50 per cent longer. In the adult group of speakers, the first noticeable fact is that four of the seven relevant differences in vowel length concern test items containing the PALM vowel. Something else that draws attention is that GOOSE is pronounced substantially longer by the speakers of SD in the test item *cartoon*, while the speakers of BSD produce the same vowel in a substantially longer way in the test item *zoom*.

When comparing the younger and adult groups, it becomes clear that the relevant differences are much more pronounced in the younger group than in the adult group. Not only are there more differences between the younger subgroups, but the differences are larger on average. The average relevant difference in the younger group is 43.92 per cent. In the adult group, this average only amounts to 28.09 per cent. Regarding vowel length, it seems as if the differences between the adult speakers are less apparent than the differences between the younger speakers. A comparison of the younger and adult speakers of each language variety can give us an understanding of the reasons for this apparent convergence. In the case of SD, the adult group has only produced four of the 19 vowels in a longer fashion than the younger group. In the other 15 instances, the younger speakers produced the longer vowel. However, in the case of the BSD subgroups, the drop in vowel length from young to old is even more pronounced. Only in two instances is the vowel length longer for the young speakers than for the adult ones. In one case, the length is the same. In the other 16 instances, the vowel length is (often much) higher in the younger group. This increased vowel length, which is found in both younger groups, could have a variety of causes. For example, it could be that the children have a harder time speaking English than the adults, which could cause the children to speak in a slower fashion, leading to longer vowels. This would then simply be a matter of experience. It could, as another example, also be a sign of a slow change in the Dutch language varieties, which is, through interference of the L1 into the L2, observable in the subjects' pronunciation of English.

5.2 Formant Measurements in the Younger Subgroups

The second objective of this experiment was to investigate any differences in spectral vowel qualities via formant measurements. Table 11 (section 4.3) shows the measured substantial differences in F_1 for subgroups 1SD and 1BSD. For the younger group, it becomes clear that the difference in F_1 is quite extensive in the vowels that were tested for. Of 18 measurable items (since the results for *goose* cannot be compared for reasons that were explained earlier), there are 17 substantial differences (50 Hz and above). The young speakers of BSD produced a lower F_1 in the test items *cartoon* and *zoom*, which both contain the GOOSE vowel. F_1 contains information regarding the open/close dimension of the vowel. This lower F_1 in *cartoon* and *zoom* indicates that young speakers of BSD produce a closer GOOSE vowel than young speakers of SD. In contrast, the young speakers of BSD produced a substantially higher F_1 in all realisations of test items containing PALM, TRAP and DRESS (the latter two both being realised as DRESS), and two out of three cases of test items containing GOAT (the F_1 in *bone* was only 46 Hz higher for subgroup 1BSD than for subgroup 1SD, and thus marked irrelevant). This indicates that these vowels are more open for the younger speakers of BSD.

Table 17 (section 4.4) shows the substantial differences in F_2 for subgroups 1SD and 1BSD. These differences are quite pronounced. Out of the 18 comparable cases, eight differences were marked as substantial (100 Hz and above). These eight cases are clearly divided: five of them involve items that contain the PALM vowel in British English (*past*, *arm*, *car*, *task* and *farm*), while the other three involve GOAT (*bone*, *stone* and *phone*). In each of these eight cases, the younger speakers of BSD produced a substantially lower F_2 than the younger speakers of SD. For the items containing GOOSE, TRAP and DRESS (the latter two both being realised as DRESS), there were no relevant differences in the younger speakers' speech production. F_2 contains information regarding the front/back dimension of the vowel. As such, the substantially lower F_2 values for subgroup 1BSD indicate that PALM and GOAT are realised as more back vowels for the young speakers of BSD. Regarding young speakers of BSD, the following can thus be concluded:

- GOOSE seems to be a closer vowel for these speakers. On average[4], the F_1 for this vowel was approximately 72 Hz lower for the young speakers of BSD than for the young speakers of SD. There were no relevant differences regarding the F_2.
- PALM seems to be more open for these speakers. On average, F_1 was approximately 158 Hz higher for the young speakers of BSD than for the young speakers of SD. With five out of six F_2 values for this vowel being substantially lower (approximately 228 Hz lower on average than their SD counterpart) for the young speakers of BSD than the young speakers of SD, it also seems that the PALM vowel is more back for the young speakers of BSD. However, PALM was never pronounced as DRESS, as was the case in the pre-test.
- GOAT also seems to be more open for these speakers. Taking into account only the substantial differences for *stone* and *phone*, on average, F_1 was approximately 112 Hz higher for the young speakers of BSD than for the young speakers of SD. Even when taking into account the result for *bone*, F_1 is still approximately 90 Hz higher on average for the young speakers of BSD. The substantially lower F_2 values for the young speakers of BSD indicate that GOAT is also more back for these speakers.

[4] In the averages for both groups, the GOOSE vowel in the test item *goose* was not taken into account in the calculations due to the different realisation of the vowel in the respective groups.

- The DRESS vowel (which was produced by our test subjects in all items that contain DRESS or TRAP in British English) also seems to be more open for these speakers. On average, the F_1 was 152 Hz higher for the young speakers of BSD than it was for the young speakers of SD.

5.3 Formant Measurements in the Adult Subgroups

Table 12 (section 4.3) shows the relevant differences in F_1 for subgroups 2SD and 2BSD. The first noticeable fact about these differences is that there are considerably fewer than in the younger subgroups. While there were 17 substantial differences in F_1 between subgroups 1SD and 1BSD, Table 12 shows only three. Furthermore, there does not seem to be a pattern between the three. The adult speakers of BSD produced a higher F_1 in the test items *goose*, *stone* and *car*, which were all realised with a different vowel (GOOSE, GOAT, and PALM respectively). The fact that the adult speakers of BSD produced the GOOSE vowel with a higher F_1 as the adult speakers of SD does stand out, since this forms a contrast with the younger subgroups, where GOOSE was produced with a higher F_1 by the speakers of SD. The results for *cartoon* and *zoom* were marked as irrelevant because the difference in F_1 was lower than 50 Hz. However, both items do display a higher F_1 for group 2BSD than for 2SD (the difference is 35 Hz for *cartoon* and 33 Hz for *zoom*). This is a small but interesting difference. The other two items do not inspire any conclusions, since the other results were not only marked as irrelevant, but also quite contradictory, some displaying a higher F_1 for BSD, while others displayed a higher F_1 for SD.

Table 18 (section 4.4) shows the substantial differences in F_2 for subgroups 2SD and 2BSD. As with the vowel length and the F_1, the differences between the adult subgroups are limited in comparison with the younger subgroups. There are only four substantial differences in F_2 between the adult subgroups. The fact that, as was also the case with the younger subgroups, the substantial differences in F_2 are limited to PALM and GOAT is noticeable. Also, the vowels seem to behave in the same way: F_2 is substantially lower for the adult speakers of BSD than for the adult speakers of SD. This is important, since it shows that the findings for the younger speakers are not merely a coincidence. However, it must be noted that there are only three relevant differences for PALM (in *past*, *arm* and *car*) and one for GOAT (in *stone*). In the other three test items that were realised with PALM by our test subjects, the difference in F_2 was minimal and far from relevant. The two other test items containing GOAT also did not display relevant results. It thus seems that no valid conclusions can be formed other than that adult speakers of BSD might, in some cases, produce PALM and GOAT with a lower F_2 than adult speakers of SD. Regarding the adult speakers of BSD, the following can thus be said:

- There are fewer differences in F_1 and F_2 for the adult speakers of BSD than there are for the younger speakers. In this regard, F_1 and F_2 seem to behave in a way that corresponds with the vowel length.
- In contrast with the younger subgroups, adult speakers of BSD seem to produce the GOOSE vowel with a higher F_1 than adult speakers of SD.
- Adult speakers of BSD seem to sometimes produce PALM and GOAT with a lower F_2 than adult speakers of SD. On average, the F_2 for the PALM vowel was 112 Hz lower for the adult speakers of BSD than for the adult speakers of SD. However, the average F_2 in the GOAT vowel was only 27 Hz lower for the adult speakers of BSD. This behaviour corresponds with the younger subgroups. However, while the younger subgroups exhibited this behaviour in all items, the adult subgroups did not.

5.4 BSD English Speech Compared to BSD

Now that some conclusions about the pronunciation of the vowels GOOSE, PALM, GOAT, and DRESS (which was used in test items that contain DRESS and TRAP in British English) in English words by speakers of BSD have been formulated, a comparison can be made between this English speech and the characteristics of BSD itself.

The GOOSE vowel only relates to Scholtmeijer's (1996) sixth characteristic of BSD: the umlaut (fronting) of the long vowels. The Dutch vowels /oː/ and /uː/ are often realised as /øː/ in BSD. The speech of neither the younger nor the adult speakers of BSD produced any pronunciation of the GOOSE vowel that signalled any connection with the behaviour of /uː/ in BSD. In the younger subgroups, the average F_1 for GOOSE was 81 Hz lower for BSD, while the average F_2 showed no relevant difference. In the adult subgroups, the average F_1 in the GOOSE vowel was actually 68 Hz higher for BSD, while the average F_2 did not show a relevant difference.

In the case of the PALM vowel, one expects the vowel to be longer and more like Dutch /aː/ (see the explanation of Scholtmeijer's (1996) description of BSD in section 2.3 for further information). This means that there should be a relevant difference in vowel length, and that F_1 and F_2 should both be higher than the PALM vowel. However, as was discussed in section 5.2, while F_1 is indeed higher for the younger speakers of BSD (the average F_1 for PALM was 158 Hz higher for subgroup 1BSD than for subgroup 1SD), F_2 is lower (203 Hz lower for subgroup 1BSD). In the adult BSD subgroup, the F_1 for the PALM vowel did not differ substantially from the SD subgroup (the average F_1 for the adult speakers of BSD was 37 Hz higher than its SD counterpart). The F_2 was substantially lower for the speakers of BSD in half of the cases. The other half showed no relevant differences. However, the average F_2 for PALM was still 112 Hz lower for subgroup 2BSD than for subgroup 2SD. The vowel length for this vowel showed a relevant difference in two out of six instances for the younger group. The average PALM produced by the younger speakers of BSD was 38 milliseconds longer than its SD counterpart. The adult group differed substantially from each other in four items, and the average PALM vowel produced by the adult speakers of BSD was also 38 milliseconds longer than its SD counterpart. Combined, the production of the PALM vowel in English speech by these test subjects seems to match the pattern of BSD in regard to vowel length (at the very least partly) and F_1. The lower F_2 does not directly match the pattern of BSD.

According to Scholtmeijer's (1996) fifth characteristic of BSD, /oː/ sometimes becomes /uː/, as was explained in section 2.3. This suggests a lowering of F_1 and F_2. The substantially lower F_2 did occur in the English speech of the younger speakers of BSD. However, F_1 was substantially higher for this subgroup in two of three cases. In the adult subgroups, a relevant difference only occurred only once for both F_1 and F_2. This implies that the pronunciation of the GOAT vowel in English speech by speakers of BSD does not exhibit the same traits as BSD itself.

DRESS should show a longer vowel length if it were to match up with BSD itself. As was described in section 5.1, four items that were pronounced with DRESS by the younger speakers of BSD did indeed show a relevant difference in vowel length with their SD counterparts. The average DRESS vowel for this subgroup was 32 milliseconds longer in than its SD counterpart. This points towards the vowel as it exists in the phoneme inventory of BSD itself. However, F_1 also showed relevant differences for this group (with an average F_1 that was 152 Hz higher than in the SD subgroup). This higher F_1 does not appear anywhere in the literature. It should, however, be noted that F_1 differed substantially for all the tested vowels in the younger subgroups. It might therefore be argued that, while there is no mention of this one vowel in the literature, there might be more vowels in BSD that do not match up in regard to F_1 with their respective counterparts in SD. There were no relevant differences for F_2. In the adult subgroups, there was no relevant difference in any of the three categories.

The evidence from this study suggests that there is at least some correlation between the characteristics of BSD and the characteristics of English speech by native speakers of BSD. While the GOOSE vowel showed no direct connection, PALM, GOAT, and DRESS in their respective English contexts exhibited traits similar to those of BSD.

6. Conclusion

This paper set out to investigate if there is a difference in the pronunciation of certain vowels in English speech by speakers of Bunschoten-Spakenburgs Dialect (BSD) and Standard Dutch (SD). Through an elicitation task, it was found that there are indeed differences between the pronunciation of these vowels by native speakers of BSD and native speakers of SD. The younger native speakers of BSD produced substantially longer vowels in eight of the 18 items that could be compared. Subjects realised four of these eight items with the DRESS vowel, while two were realised with PALM. The adult speakers showed a substantial difference in vowel length in seven cases. Four of these were realised with the PALM vowel. The young native speakers of BSD produced a substantially more open PALM, GOAT and DRESS, and a closer GOOSE vowel than the young native speakers of SD. They also produced a more back PALM and GOAT. The adult speakers of BSD showed fewer relevant differences in F_1 and F_2. No pattern was recognisable in the production of F_1. The relevant differences in F_2, although much less in number than in the younger subgroups, were limited to PALM and GOAT, as was the case with the younger speakers of BSD. Although some of these differences in English speech matched the differences between BSD and SD, this study did not find enough direct correlations to prove that these differences in the pronunciation of

English are a direct effect of interference from the L1. We feel that more large-scale research on this topic is necessary to investigate if there are other factors that shape the differences. Perhaps the inclusion of other dialects would also be a benefit.

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Appendix A

Questionnaire for subgroups 1SD and 1BSD

Onderzoek Spreekvaardigheid Engels

Testpersoon nr. Bunschoten-Spakenburg/Amersfoort

Leeftijd:

Datum:

Vraag: Antwoord:

- Spreek je thuis een dialect? JA / NEE
- Spreek je op school een dialect? JA / NEE
- Spreek je een dialect als je praat met je vrienden? JA / NEE
- Spreekt je vader een dialect? JA / NEE
- Spreekt je moeder een dialect? JA / NEE
- Is er een situatie waarin je geen dialect spreekt? (vul hieronder in)

Appendix B

Questionnaire for subgroups 2SD and 2BSD

Onderzoek Spreekvaardigheid Engels

Testpersoon nr. Bunschoten-Spakenburg/Amersfoort

Leeftijd:

Datum:

Vraag: Antwoord:

- Spreek je thuis een dialect? JA / NEE
- Spreek je op werk een dialect? JA / NEE
- Spreek je een dialect als je praat met je vrienden? JA / NEE
- Is er een situatie waarin je geen dialect spreekt? (vul hieronder in)

Appendix C

Appendix C: sentence paper

Spreek alsjeblieft de volgende zinnen uit.

1. I will say cartoon one more time.
2. I will say past one more time.
3. I will say bone one more time.
4. I will say goose one more time.
5. I will say arm one more time.
6. I will say gap one more time.
7. I will say dress one more time.
8. I will say palm one more time.
9. I will say backpack one more time.
10. I will say stone one more time.
11. I will say car one more time.
12. I will say zoom one more time.
13. I will say cat one more time.
14. I will say task one more time.
15. I will say pest one more time.
16. I will say phone one more time.
17. I will say farm one more time.
18. I will say left one more time.