The Role of Media Input in Second Language Acquisition

MA Thesis "Taal, Mens en Maatschappij"

Utrecht University

August 2010

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INTRODUCTION

There is no doubt that in any form of language acquisition, be it that of a first (L1) or a second language (L2), input is essential to the success of the enterprise: language acquisition does not take place out of the blue. The ideal form of input is naturalistic language input received while immersed in surroundings where the target language (TL) is spoken, as is usually the case for first language acquisition (L1A). Unfortunately, this language learning scenario is only infrequently possible for second language acquisition (L2A). Idiosyncratic situations such as a specialist university training programme aside, often the L2 can only be studied in a relatively unsophisticated classroom setting without the possibility of travelling to the TL country for an extensive amount of time. Such a classroom setting cannot nearly offer the quality and especially the quantity of TL input that immersion could. The available aural TL input in many classrooms stems from the speech of instructors or teachers, who are often non-native speakers of the TL themselves, and from a certain amount of enhancing audio or video material. At least, this is often the case in L2 classrooms in the Netherlands.

Studying English as an L2 is obligatory in Dutch secondary education. However, the interlanguage (IL) levels of the individual students can vary greatly (cf. Hess 2). This could be caused by a multiplicity of factors, such as motivation, language learning aptitude, and/or the amount of exposure to English language input outside of the classroom. This thesis will explore the effects of the latter, namely the influence of the amount of English language input that is received outside the classroom. Regardless of what initiates the individual variation, however, it can cause undesirable effects within the classroom due to the fact that the offered subject matters could be much too easy for some students, whereas they prove a lot more difficult for others. This makes it difficult for the teacher to establish a curriculum and a tempo to benefit everyone.

In the Netherlands, English can be heard in all the media: television, radio, internet, computer/video games, and so on. Moreover, subtitling for television broadcasting or for film theatre screening is a much more common practice than dubbing. Generally, only broadcasts or screenings that target a younger audience (i.e. primary school pupils) are dubbed and virtually every show for older viewers is presented in the original language, enhanced by Dutch subtitles. A large amount of popular music targeting a pre-adult audience is in English. Even many Dutch artists prefer to sing English lyrics, which are of varying quality.

Furthermore, forms of written and spoken English are, of course, widely available on the internet and in video games.

Despite what its vast presence in the media might suggest, however, English is not an official language in the Netherlands, nor is it a major language of communication in everyday life in Dutch society. Consequently, a large part of the English input that teenage L2 learners receive outside the classroom originates from the media and not from, for example, native speaker interaction, as it would in an immersion setting.

Naturally, as was mentioned before, the amount of media input each L2 learner is exposed to can vary greatly, because interest in television programmes, films, computer/video games, music, etc. in the English language is subject to much variation. The aim of this thesis is, therefore, to investigate the role media input plays in L2A by comparing the language proficiency of secondary school pupils who are exposed to small amounts of L2 media input with that of pupils who are exposed to larger quantities of L2 media input.

The first section of this thesis summarises different views on input theory and previous studies on the role of the media in L2A. Next, the second section will focus on the present study by describing its concrete aims, methodology, test materials, the followed procedure, as well as the results and a discussion of these results. The final section contains a brief summary and the conclusion of the present study, which is that exposure to English media input does indeed seem to positively affect L2 proficiency.

1 PREVIOUS STUDIES

1.1 Input theory

Input, as defined by Lightbown & Spada (2006), is "[t]he language that the learner is exposed to [...] in the environment" (201). As Gass (1997) describes, "it is an incontrovertible fact that some sort of input is essential for language learning; clearly, languages cannot be learned in a vacuum. What is controversial is the type and perhaps amount of input necessary for second language development" (86). Therefore, opinions on the exact nature of the role input plays in the L2A process differ widely among the proponents of different models of L2A, as will become clear in the following paragraphs.

Among the proponents of Universal Grammar (UG), opinions on the availability of the principles and parameters of UG in L2A differ widely. If, however, UG is still fully accessible in L2A, L2 input could, according to White (1990), "underdetermine the L2 grammar in precisely the same way that L1 input underdetermines the L1 grammar" (126) and serve as a "trigger for activating internal mechanisms" that enable L2A (Saville-Troike 105). On the other hand, access to UG in L2A could also be "mediated by L1 knowledge", which, according to White, may cause "the L2 learner [to] use principles and parameter settings from the L1, at least initially, as an interim way of dealing with the L2 data" (127). Parameter resetting to the L2 values, then, would require "input interacting with a still active UG" (White 127). In the UG framework, therefore, input only plays a minor role; according, for instance, to Gass (1997), from a UG perspective, input "only serves as a catalyst or trigger for innate properties" (93).

Psycholinguistic approaches, moreover, consider input that is not only heard, but in fact processed (i.e. intake), to be essential during all stages of language acquisition (Saville-Troike 105). VanPatten & Cadierno (1993), for instance, propose that "the input necessary for language acquisition must contain meaning to which the learner attends for its propositional content" (46). In other words, the input received by the L2 listener has to become meaningful. The L2 learner can deduce the meaning of new words and grammar from the context, but only if they are presented with just a 'little bit' of new language information. If there is too much new information, the meaning will be lost. This idea is in line with Krashen's (1985) Input Hypothesis, which basically maintains that language acquisition takes place if there is enough comprehensible input. He claims that "humans acquire language in only one way – by understanding messages or by receiving 'comprehensible input'" (2). Comprehensible input is

L2 input that can be understood by learners despite them not understanding all the specific words and structures in it. It is described as one level above that of the learners if it can only just be understood. According to Krashen's theory, giving L2 learners this kind of input helps them acquire the TL naturally, rather than learn it consciously. Followers of Krashen, then, believe that input is not only necessary for language acquisition to occur, but that it is in fact sufficient in itself to account for L2A.

Not all researchers, however, adhere to this 'sufficiency of (comprehensible) input' point of view. Especially sociolinguistically orientated linguists consider input alone to be insufficient for language acquisition to occur. They claim that interaction is essential to the process as well (106). Gass (1997) describes the input-interactionist perspective as follows: "the input to the learner coupled with the learner's manipulation of the input through interaction forms a basis of language development" (86-87). Likewise, Saville-Troike (2006) sums up the interactionist perspective as follows:

> what is acquired in L2 includes only that portion of L2 input 'which is assimilated and fed into the IL system' (Ellis 1985:159); L2 is acquired in a dynamic interplay of external input and internal processes, with interaction facilitating (but not causing) SLA [i.e. Second Language Acquisition] [...]. However, reciprocal interaction as a source and stimulus for learning ignores 'autodidacts' who teach themselves from books and recordings. (111)

It is important to note that not all input is necessarily noticed by language learners. They could, for example, listen to songs in English, but not consider the actual lyrics, or when watching films and television programmes they could merely be reading the subtitles and not focus on the dialogue at all. This would mean that some of the input they receive does not become intake, or only very subconsciously so. Unfortunately, it would be difficult to assess let alone quantify the amount of media input that is actually taken in by the learners or contains meaning and, therefore, this will not be attempted in the present study. Based on Schmidt (1990), who states that the frequency in which items are encountered influences the degree of noticing, it will be assumed for the purpose of the current study that exposure to a larger quantity of input equals larger intake.

Furthermore, the classroom setting does not allow for much interaction with native speakers of the TL. Therefore, for the present study, it will be assumed that interaction merely aids L2A, but is not essential. This idea is supported by Gass et al. (1998), who claim that "[a]lthough interaction may provide a structure that allows input to become salient and hence

noticed, interaction should not be seen as a cause of acquisition; it can only set the scene for potential learning" (305).

Saville-Troike (2006) says the following about listening:

> Listening accounts for most of the language input for L1 acquisition by children, but L2 learners often have much less opportunity to hear the target language and therefore receive proportionally less input via this channel. Listening is a critically important activity, however, both for learners who want or need to participate in oral interpersonal communication and for learners who want or need to receive information from such oral sources as lectures and media broadcasts. (159)

Input/intake rather than interaction, then, is assumed to be a major factor contributing to the proficiency level of L2 learners. This assumption is strengthened by findings in Brasileiro (2009), who – at the end of her thesis on bilingual language acquisition – concludes that children who received a smaller quantity of input required a longer time to acquire certain contrasts (143). There is no reason to assume that quantity of input does not also play a role in L2A. It will also be assumed here that there is no distinction in this respect between different kinds of input: specifically, learners exposed to more input from the media are more proficient in the TL than those who receive less input. The present study is designed to find evidence to validate this assumption.

As Piske & Young-Scholten (2009) state: "[f]ew of us have a deep or detailed understanding of what providing 'good', 'rich' or 'varied' input entails, and we lack awareness regarding the amount and nature of the input to which learners are exposed outside the classroom [...]" (Introduction 16). The current study aims to shed light on this matter and on the role media input plays in the L2A process.

1.2 Studies on the role of media input in language acquisition

The notion of a "visually oriented society", as described, for instance, by Di Carlo (1994) in his study on the application of video-texts in L2A, entails that the modern-day media have had and, of course, do have an impact on the learning styles of young learners. Di Carlo explains that "[t]he global emotional activity of 'looking and listening' generates in our memory sensory system a more active and convincing comprehension than any simple verbal explanation" (468). Consequently, it seems plausible to assume that language learners' L2A benefits from TL exposure through media such as television, internet, and video games, in which the aural input is accompanied by visual images. Specifically, it is highly likely

beneficial to the learning process that these visual images show the learner the kinetic behaviour (e.g. gestures, body movements, facial expressions, etc.) that correspond with what they hear. According to Di Carlo, these visual examples of kinetic behaviour "enable students to identify the communication needs and behavior of their interlocutors, and discover the language required to respond to those needs [...]. They are thus exposed to a variety of situations and people with different speech patterns, backgrounds, education, age, sex, and culture" (469). Being able to connect the aural L2 input with the accompanying kinetic behaviour could therefore be one of the advantages L2 learners who are exposed to larger amounts of L2 media input have over L2 learners who are exposed to less L2 media input that could lead to augmented language acquisition.

Besides the visual aid the media provide to L2 learners, watching subtitled television programmes and films in the TL could also cause incidental L2A. This has been investigated by, among others, D'Ydewalle & Van de Poel (1999). They say that "[p]revious research on adults has demonstrated incidental foreign-language acquisition by watching subtitled television programs in a foreign language" (227); they conducted a similar study with children which revealed "real but limited foreign-language acquisition" (242). They found that L2A was aided by the fact that the native language was also present in the form of subtitles (228).

2 PRESENT STUDY

2.1 Introduction

2.1.1 Experimental hypothesis

Based on the previous studies, as presented in §1.1 and §1.2, the following hypothesis will be tested in the present study: exposure to L2 media input positively affects L2 proficiency. The gist of the abovementioned studies strengthen the idea that media input plays a role in L2A, presumably a significant role. Having established this, we now turn to the actual topic of this thesis.

This thesis is based on a study of the L2 English language proficiency of two groups of Dutch secondary school students. One group consisted of students who indicated to receive little English input from the media and the other group indicated a much larger quantity of English media input. Comparing the results of the two test groups could provide an answer to the experimental hypothesis that media input does positively affect L2A. The characteristics of the two groups of participants in the present study are described in §2.1.3, and the design of the experiment as well as its results are discussed in §2.2 and §2.3.

As an indication of L2 proficiency, the participants in the present study were asked to take part in a pronunciation task, as well as complete the CD-ROM version of the Oxford Quick Placement Test (QPT). The former will provide an indication of the participants' L2 production proficiency and is aimed to test for negative transfer from the L1 (Dutch) to the L2 (English), causing accented L2 speech. The latter provides a useful indication of general L2 proficiency with regards to vocabulary, grammar, listening skills, and reading skills. Together, the two tasks will provide a solid indication of the L2 proficiency as they test for many of the most common denominators of L2 proficiency, apart from writing skills and other verbal skills besides pronunciation, which are not tested in the current experiment.

As said, the participants consisted of two groups: Group I, the low exposure group, consisted of L2 learners who enjoyed limited exposure to English input from the media (<14 hours a week), whereas Group II, the high exposure group, indicated to be exposed to many more hours of media input (>21 hours a week). More will be said about these practical definitions of low and high exposure below. The overall test results for the two groups, i.e. their pronunciation task and QPT results combined, are compared in §2.4 in order to provide

an answer to the research question of whether exposure to L2 media input influences L2 proficiency.

2.1.2 Predictions to be tested

Regarding the central hypothesis of this thesis, as formulated above, L2 media input is expected to benefit L2A. In a more direct formulation, the results from the current study are expected to show better results for L2 learners who have been and/or are exposed to large amounts of L2 media input. They are predicted to have, at the moment of testing, a higher level of general L2 proficiency, as well as less accented L2 speech. The pronunciation task is thus expected to reveal fewer 'errors' for the high exposure group (Group II) than for the low exposure group (Group I), 'errors' being instances of negative transfer from Dutch in their L2 pronunciation.

The prediction for the QPT is that the high exposure group will perform better than the low exposure group. The QPT tests for L2 proficiency regarding vocabulary, grammar, listening, and reading. Since exposure to L2 media input is expected to benefit L2 proficiency, Group II, on average, is predicted to be at a higher ALTE level than Group I.

The participants' overall language proficiency will be determined by combining the results from the pronunciation task and the QPT. Overall, Group II is expected to perform significantly more native-like than Group I due to the fact that they are exposed to larger quantities of English input from the media.

2.1.3 Participants

All participants of the current study were, at the time of testing, in their second year of secondary school at the highest possible educational level in the Netherlands, namely VWO (i.e. pre-university level), which is an educational programme that prepares them for a matriculation exam after six years of training. In their educational history, they all had received a highly similar amount of L2 English instruction, namely almost two years in the same secondary school for two hours per week and two years in primary school for approximately one hour a week. All participants were aged between 13;5 and 14;7 at the time of testing, with a mean age for both groups of 14;2, hence excluding any possible age effects.

A pre-test questionnaire was administered in order to collect crucial information on how much media input the participating L2 learners received. The L2 learners were requested to complete a form asking them about their language background, level of education,

language learning impairments, school grade for English, and their exposure to L2 input from different media. Literally, the question about the last mentioned characteristic of their language profile was: "How many hours a week do you HEAR English around you outside school?"[1] Accompanying this question was a table in which the participants were asked to keep track of how many hours of English input they received from television, films, music, internet, computer/video games, and 'other media' during seven days. Asking the participants to keep track of the amount of input they received for one week was expected more likely to provide a realistic and reliable assessment of the amount of received media input than merely asking the participants to estimate their weekly exposure.

Only learners with a monolingual Dutch L1 background who were learners of L2 English through traditional classroom instruction exclusively and who did not have any language learning impairments were invited to participate in the current study. Those who spoke any other languages, apart from those they studied as part of the school's curriculum, were excluded from the experiment to avoid transfer from any other language than Dutch.

Using the filled out questionnaires, a selection of participants was made containing 15 subjects who had indicated to receive little L2 media input (i.e <14 hours a week) in Group I and an equal number of participants who received a comparatively large amount of L2 media input (i.e. >21 hours a week) in Group II. A specification of the different types of media that provided the L2 input (e.g. television, music, internet, etc.) and a representation of how many hours a week the participants were exposed to each of these different media is given in Table 10 in Appendix A. This table shows that the largest quantity of L2 media input came from music, followed by watching television.

The exact characteristics of all 30 subjects are presented in Table 1 below. This table shows that the mean time of exposure for Group I was 8.4 hours a week (SD = 2.5) and the mean for Group II was 32.5 hours a week (SD = 9.5). This difference between the amount of exposure of Group I and Group II was found to be significant (T = -9.448, Sig. 2-tailed = 0.000), based on an Independent Samples T-test, as can be seen in Table 11 in Appendix B.

There was an equal distribution of male (M) and female (F) participants in both groups, in order to prevent any gender effect. Accordingly, Group I consisted of 8 female and 7 male participants and Group II consisted of 8 male and 7 female participants.

[1] This is a translation, because the questionnaire was in the L1 of the participants (Dutch). The question in Dutch was: "Hoeveel uur per week HOOR jij Engels om je heen buiten school?"

Group I	Gender	Age	Grade	Exposure
1	F	13;10	5.7	7
2	F	14;6	5.7	7.5
3	F	14;6	5.8	5.75
4	M	13;8	5.5	7
5	M	14;5	6.5	11
6	F	14;4	7.2	11
7	M	13;10	4.8	9.5
8	M	13;11	5.6	12
9	M	14;1	7.8	8
10	M	14;6	7.2	12.5
11	M	14;5	5.1	5.25
12	F	14;5	6.7	10.25
13	F	14;0	5.7	5.75
14	F	14;7	7.5	4.75
15	F	13;10	6.2	9.25
	Mean	14;2	6.2	8.4
	SD	0;6	0.9	2.5

Group II	Gender	Age	Grade	Exposure
16	F	14;1	5.0	40.5
17	F	14;2	6.1	45.5
18	F	13;9	5.3	21
19	F	14;2	6.3	29.5
20	F	14;5	6.5	37
21	F	14;2	6.1	28
22	M	13;9	5.8	21
23	M	14;7	7.0	44
24	M	13;11	4.6	21
25	M	14;0	4.9	32
26	M	14;4	6.8	34.5
27	F	14;0	6.6	23.25
28	M	14;7	7.4	35
29	M	14;6	5.5	25
30	M	14;3	6.9	50
	Mean	14;2	6.1	32.5
	SD	0;3	0.8	9.5

Table 1: Participant characteristics: subject number, gender, age, school grade, and amount of exposure to English media expressed in hours per week.

Surprisingly, the mean school grade for the high exposure group was slightly lower (6.1) than for the low exposure group (6.2), as can be seen in Table 1 above. One would expect better school results for English for those who received more English media input if the amount of input indeed influenced L2 proficiency. A first conclusion that can be drawn based on the outcome of the pre-test questionnaire, then, is that there is no correlation ($r = 0.093$) between the amount of L2 media input the participants received and their school grade, as Table 12 in Appendix B shows. However, the participants' school grade might not be entirely representative of their L2 proficiency. The results of the experiments in the present study will most likely be able to provide a good indication of whether or not the participants' school grades correlate with their L2 proficiency level.

2.2 Pronunciation task

2.2.1 Methodology

The first of the two tasks the participants were asked to perform was a pronunciation task. L2 pronunciation is deemed important in the present study because pronunciation errors can cause a loss of intelligibility, resulting in miscommunication between native and non-native

speakers, or among non-native speakers. Moreover, pronunciation errors which do not interfere with intelligibility per se, but only cause accented speech, can still become problematic, because, as Van den Doel (2006) concluded, "intelligibility is not the sole criterion used by native speakers in deciding whether a particular pronunciation error is acceptable. Respondents' emotive reactions to certain stigmatised realisations indicate that factors such as irritation or amusement also play a part [...]" (287). Learners should therefore aim to minimise negative transfer from their L1 in their L2 pronunciation. This is probably easier said than done, because for beginning L2 learners, transferring the phonological rules of their L1 is a very natural thing to do. Piske & Young-Scholten (2009), for instance, point out, referring to Sharwood Smith & Truscott (2005), that "once the L2 learner has auditorily processed environmental stimuli, the next step is assigning native language phonological structures to these acoustic data" (20). The pronunciation task of the current study will therefore test whether extended exposure to English media input could help reduce negative transfer.

The pronunciation task consisted of a short story which the participants were asked to read out loud. This was recorded in *Praat*, as well as on video. The story (see Appendix C) was an adaptation of an English story for children from the British Council website, which should have ensured that the text was not too difficult for the participants. The story contained a number of test items, which were selected to check for ten of the most common errors made by Dutch L1/English L2 learners, based on Collins et al. (2001). These pronunciation errors cause an accent in L2 speech and some could lead to miscommunication. The test items were placed in the context of a story, rather than presented in isolation or in separate sentences, so as to avoid drawing the participants' attention to what was being tested. The test items checked for the errors (i-x) listed below caused by negative transfer from Dutch to English. This list was compiled by the experimenter, selecting from the most common pronunciation errors made by Dutch learners of English as reported by Collins et al. (2001):

i) Lack of aspiration; this may cause confusion between, for example, "push~bush".
ii) Final devoicing; this may cause confusion between, for example, "log~lock".
iii) Confusion of /v/ and /f/; this may cause confusion between, for example, "leave~leaf".
iv) Pronunciation of /ð/ as [d] and /θ/ as [t] or [s]; this may cause confusion between, for example, "thin~tin~sin", "then~den", "heather~header".

v) Pronunciation of /z/ as [s] in non-final position; this generally does not cause confusion, but does result in accented speech.

vi) Lack of liprounding for /w/; this may cause confusion between, for example, "west~ vest" and result in accented speech.

vii) Uvular, trilled, or tapped pronunciation of the alveolar approximant /ɹ/; this generally does not cause confusion, but does result in accented speech.

viii) Vowel length similar before voiced and voiceless consonants; this may cause confusion between, for example, "seat~seed", "neat~need".

ix) No contrast between DRESS vowel /ɛ/ and TRAP vowel /æ/; this may cause confusion between, for example, "set~sat", "lend~land", "beg~bag".

x) FOOT vowel /ʊ/ pronounced as GOOSE vowel [u:]; this may cause confusion between, for example, "look~Luke" and result in accented speech.

2.2.2 Materials

The text that the participants were asked to read out loud is presented in Appendix C. The text is in English and contains twenty test items, i.e. two test items for each of the ten test conditions that were presented in §2.2.1 (i-x). Each correctly pronounced test item accounted for 5% of the total possible score of 100%. If no pronunciation errors were made as far as the test items were concerned, the participant would score 100%. The assumption here was: the lower the score, the more accented the L2 pronunciation. Pictures were added to accompany the text in order to clarify its meaning. Presented in Table 2 below are both test items for each of the experimental conditions that were selected for analysis (i-x). The number of the line in which the test item in question occured is also given and corresponds with the line numbers in the actual story as presented in Appendix C.

Test conditions		Test items	Control
i)	Lack of Aspiration	time (l.1) push (l.7)	- -
ii)	Final devoicing	had (l.10) log (l.16)	- -
iii)	Confusion of /v/ and /f/	leave (l.2) very (l.17)	leaf (l.12) ferry (l.2)
iv)	Pronunciation of /ð/ and /θ/	then (l.9) thin (l.10)	- -
v)	Pronunciation of /z/ as [s]	houses (l.3) noisy (l.13)	- -

Test conditions		Test items	Control
vi)	Lack of liprounding for /w/	wheel (l.4) water (l.9)	- -
vii)	Uvular, trilled, or tapped /ɹ/	dry (l.5) rain (l.15)	- -
viii)	Vowel length	need (l.6) seed (l.13)	neat (l.3) seat (l.16)
ix)	No contrast between /æ/ and /ɛ/	bag (l.1) sat (l.10)	beg (l.8) set (l.8)
x)	No contrast between /ʊ/ and /u:/	look (l.3) foot (l.8)	Luke (l.1) shoot (l.10)

Table 2: Test items pronunciation task

For some of the test items, a control item was inserted in the text in order to be able to draw comparisons. The control items are also presented in Table 2 with their corresponding line numbers.

2.2.3 Procedure

The pronunciation task was conducted in a quiet room. The necessary equipment were a computer with *Praat* installed on it, which can be downloaded for free off the internet, a video camera and a microphone, as well as a copy of the story.

During the pronunciation task, the participant sat across a table from the experimenter. This enabled the experimenter to operate the camera and take notes without distracting the participant too much. Before starting, however, the experimenter had to ensure that the computer did not block their and the camera's view of the participant's face. The computer screen faced the experimenter and not the participant so that the participant could not be distracted by it and so that the experimenter could make sure the recording was working properly. The only items the participant had in front of them were the text they were supposed to read and the microphone.

The experimenter instructed the participant to read the entire text, starting with the title, and to speak clearly into the microphone. Instructions were given in Dutch, in part so as not to influence the participant's pronunciation, but certainly also to ensure that the instructions were well understood by the participant. The participant was allowed to skimread the text before starting and was pointed to the pictures, which could clarify the meaning of what was being read out. As soon as the participant indicated to understand the task and felt comfortable and confident enough to start, the recording could commence.

2.2.4 Analysis

Voice Onset Time

Whether or not the participants' pronunciation lacked aspiration was determined by analysing the Voice Onset Time (VOT) in *Praat*. Flege & Eefting (1987) explain how, in English, stressed syllables starting with /p,t,k/ should be produced with long-lag VOT (i.e. aspirated), whereas in Dutch they would be pronounced with short-lag VOT (i.e. unaspirated), which might therefore be transferred by Dutch learners of English in their L2 pronunciation (186). As Collins et al. (2001) found, this error is all too common in the pronunciation of English by

Dutch learners. The VOT for the different phonemes /p/, /t/, and /k/ differs in native English pronunciation. As the current study focused on the production of /t/ and /p/ only, native speaker data from previous studies on the VOT of these particular phonemes were relevant. Flege & Eefting, for example, found that the VOT for /t/ ranges between 66.8 and 114 ms for adult native speakers of British English, whereas Riney et al. (2007) found that the VOT for /p/ ranges from 60.4 to 96 ms in the pronunciation of native speakers of American English. The VOT for /p/ may therefore be a bit shorter than for /t/, but the difference could also be caused by regional variation in VOT for different varieties of English, which is why, in the current study, the analysis was based on Lisker & Abramson's (1964) general definition of short-lag and long-lag. They describe short-lag consonants to have a VOT of 0 to 25 ms and long-lag consonants' VOTs to range from 60 to 100 ms. These ranges have been adopted in the present study to determine whether or not the participants' production was native-like.

As said, the current experiment aimed to determine whether the participants transferred their Dutch short-lag plosives to their L2 pronunciation, or whether they had acquired this aspect of the L2, or whether they resided somewhere 'in the middle,' i.e. had moved away from the short-lag L1-like pronunciation, but were not quite native-like yet since their VOT was between 25 and 60 ms. Consequently, participants of the present study were deemed native-like in their pronunciation of English with respect to VOT if their VOT was 60 ms or longer for the two test items in the experiment. This would earn them a score of 5% for each correctly pronounced test item. If they transferred their Dutch L1 properties and had a VOT of 25 ms or less, they scored 0%. In case their pronunciation appeared to be in an 'in between' state, i.e. neither short-lag nor long-lag (between 25 and 60 ms), they would only score half the possible points for the test item in question: 2.5%.

Final devoicing, /v/~/f/, /ð/ and /θ/, /z/~[s], liprounding for /w/, and /ɹ/

Whereas Dutch is a language which has final devoicing, this does not exist in English. The noun "hand" is pronounced with a final [t] in Dutch, but with a [d] in English. Transfer of final devoicing by Dutch learners of L2 English results in accented speech and could lead to miscommunication when, for example, "cab" is pronounced as [kæp] instead of [kæb]. Another common error made by Dutch learners of English that could cause miscommunication and accented speech is that they often do not distinguish in their pronunciation of /v/ and /f/ (e.g. "very~ferry"). Also, the pronunciation of /ð/ as [d] and /θ/ as [t] or [s] (e.g. "then~den", "thin~tin~sin") and the pronunciation of /z/ as [s] in non-final

position could lead to miscommunication or at least accented speech. Furthermore, according to Collins et al. (2001), Dutch learners of English often mispronounce /w/, due to a lack of liprounding, and the alveolar approximant /ɹ/, which is often pronounced as either an alveolar trill [r], an alveolar tap [ɾ], or a voiced uvular fricative [ʁ], which are all Dutch allophones of /ɹ/.

Analysis of final devoicing, /v/~/f/, /ð/ and /θ/, /z/~[s], liprounding for /w/, and /ɹ/ was done by ear – or eye, as the video recordings were helpful to determine whether or not liprounding for /w/ occurred – by the experimenter who has had extensive phonetic training and is a near-native speaker of English.[2] Nonetheless, by means of control, three native speakers of General Australian English were asked to identify a selection of the data from the current study. More will be said about the results of their involvement below.

For the test conditions "final devoicing", "/v/~/f/", and "/ð/ and /θ/",[3] a number of randomly selected sound fragments were taken out of their contexts and presented in isolation to the control group in six identification tasks (one for each test item) created in *Praat*. Each of the six tasks contained five samples of the test item in question, which made for a total of thirty identification items. Each identification item was repeated three times in its identification task, resulting in fifteen items per identification task. An example of what the identification tasks looked like is presented in Figure 1 below.

The control group was instructed to download the *Praat* software and to install the programme on their computers. Next, the six different files containing the identification tasks were e-mailed to them, along with instructions on how to open the files in *Praat* and an explanation of how the tasks worked. Finally, the controls were instructed on how to save the results and were asked to send the files containing the results to the experimenter via e-mail.

In the identification tasks, the controls were presented with the sound bites and were asked to choose which word they heard from the minimal pairs, i.e. "had~hat", "log~lock", "leave~leaf", "very~ferry", "then~den", "thin~tin", by clicking on the corresponding button. The control group was, for example, presented with the sound bites of five different

[2] The experimenter has been immersed in an English speaking country, Australia, for one year (July 2001 – July 2002). Furthermore, the experimenter has received approximately twelve years of English instruction in a classroom setting before moving on to study the language at university for three years, during which time she has also received extensive training in phonetics. Based on the QPT, the experimenter has reached the Mastery or Upper Advanced stage of language acquisition, which corresponds with ALTE level 5 and CEFR level C2.

[3] The test conditions "/z/~[s]", "liprounding for /w/", and "/ɹ/" were not included in the control tasks, because there were no minimal pair distinctions for the test items in the pronunciation task.

participants' pronunciations of "had" and were asked whether they thought they heard "had" or "hat". Each of these five items were randomly repeated three times. If the controls identified the same sound fragment as "hat" twice and as "had" once, the item would be considered to have been identified as "hat". In case the controls felt they did not hear a sound properly, they could click on the button on the bottom of their screen in order to replay the sound. This could be done as often as necessary.

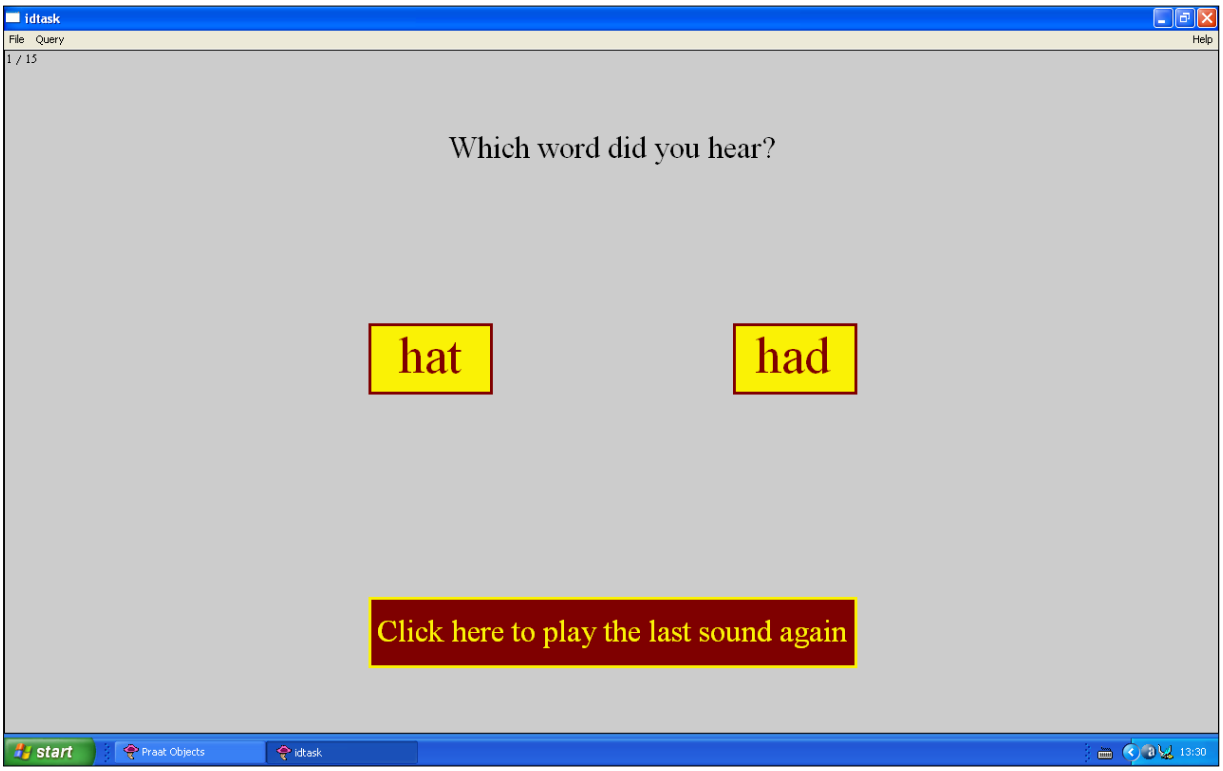

Figure 1: Identification task

Analysis of the control group's identification task results showed that their identification of the randomly selected test items corresponded with that of the experimenter in 91.1% of the cases. The analysis by the experimenter of the collected data for the test conditions "final devoicing", "/v/~/f/", "/ð/ and /θ/", "/z/~[s]", "liprounding for /w/", and "/ɹ/" is therefore deemed native-like and sufficiently accurate to allow meaningful further discussion of the results.

There were no 'half point scenarios' for the test items of the abovementioned test conditions. The participants' production was either judged to be correct or incorrect and could therefore result in a score of respectively 5% or 0% for each test item.

Vowel length

In English, vowels preceding a voiced consonant should be longer than those preceding their voiceless counterpart. Hewlett et al. (1999) even state that "[i]n most English accents vowel length is approximately 50% greater before a voiced consonant than before its voiceless cognate (the 'Voicing Effect')" (2157). This "Voicing Effect" (VE) has been examined for several varieties of English in order to determine the minimal difference in vowel length that the participants of the present study should exhibit to be considered native-like. Native speaker results for different varieties of British and American English from Raphael et al. (1980), Hewlett et al. (1999), Tauberer & Evanini (2009), and Gimson (1980) were compared. Raphael et al. (1980) found the smallest VE, namely a ratio of only 1.07:1. The standard for the participants of the present study was determined based on these results.

The participants were presented with two minimal pairs differing only in the coda of the word for [+VOICE] versus [-VOICE] counterparts, for example "need" and "neat". *Praat* was used to determine the participants' vowel duration in the test and control items, which made it possible to determine whether or not the participants distinguished in vowel length between vowels preceding voiced and voiceless consonants. For each test item, the participants scored 5% if their vowel before the voiced consonant was at least 1.07 times longer than the vowel before its voiceless cognate. When the vowel preceding the voiced consonant was less than 1.07 times longer, but longer nonetheless, the participants received a score of 2.5%. If the duration of both vowels was equal, or the vowel preceding /d/ was shorter than the one preceding /t/, no points were awarded, since this is considered unacceptable in the TL for the native speaker data in the studies mentioned above.

DRESS and TRAP vowel

Although the equivalent of the English DRESS vowel /ɛ/ is part of the Dutch vowel system, the TRAP vowel /æ/ does not exist in Dutch. Since the unfamiliar /æ/ is relatively close to /ɛ/ in terms of phonetic space, low-level Dutch speakers of L2 English tend to pronounce the TRAP vowel as a DRESS vowel. Whether or not this is the case can be determined by examining the formant frequencies of the vowel. The first formant (F1) value indicates how open (or closed) the mouth is when the vowel is produced, whereas the second formant (F2) value indicates whether the vowel is produced more toward the front or the back of the mouth. Based on several studies that reported on the F1 and F2 values for the vowels produced by native speakers of different varieties of English (Hillenbrand et al. 1995; Peterson & Barney

1952; Ferragne & Pellegrino 2010; Hawkins & Midgley 2005; Clermont 1996),[4] it was decided here that the F1 for /æ/ should be between 558 and 1010 Hz and the F2 between 1333 and 2501 Hz in order to possibly be considered native-like, as these values represent the extremities found among the native speakers of different varieties of English. Furthermore, the difference between /æ/ and /ɛ/ had to be assessed. In all native speaker studies mentioned above, the F1 was higher for /æ/ than for /ɛ/, which indicates that the vowel is more "open" (i.e. the mouth should be opened wider). Moreover, based on the same data, the F2 should be lower for /æ/ than for /ɛ/, which means that /æ/ is pronounced more "back" than /ɛ/. The smallest difference in F1 was found in the male native speakers of American English from the study by Hillenbrand et al. (1995) and constituted a mere difference of 8 Hz. The male native speakers of American English from Peterson & Barney (1952) showed the least difference in F2, namely 120 Hz. In the current experiment, the test items' F1 and F2 were judged separately, because even if only one of the formants was pronounced with a native-like frequency and was sufficiently different from the corresponding control item's formant value, this still indicated that the participant distinguished between /æ/ and /ɛ/.

Therefore, the F1s for /æ/ in the test items had to fall within the range of 558-1010 Hz and be at least 8 Hz higher than the F1s for /ɛ/ in the corresponding control items in order to be considered correct. If they fell within the determined range, but were less than 8 Hz higher, or did not fall within range at all, the F1s of /æ/ would not be considered native-like. If both test items' F1s were correct, this would result in a score of 5%. If only one of the test items' F1s was correct, a score of 2.5% would be awarded. If neither of the test items were pronounced with an F1 that complied with the aforementioned stipulations, no points would be awarded.

The F2s for the test items had to lie between 1333-2501 Hz and be at least 120 Hz lower than the F2s of the accompanying control items. Again, if the F2s were correct for both test items, the participants would score 5%. If one of the F2s was correct, but the other was

[4] Hillenbrand et al. (1995) and Peterson & Barney (1952) present formant frequency data of male, female, and child native speakers of American English. Ferragne & Pellegrino (2010) present F1 and F2 data for native speakers of English from the following regions of the United Kingdom: Birmingham, Cornwall, East Anglia, East Yorkshire, Glasgow, Lancashire, Liverpool, Newcastle, North Wales, Ulster, and the Scottish Highlands. Furthermore, they presented the formant values of native speakers of Standard Southern English as well as of different native speakers from the Republic of Ireland. Hawkins & Midgley (2005) gathered formant value information of native speakers of Received Pronunciation (RP) and distinguish between different adult age groups. Lastly, Clermont (1996) investigated the vowel pronunciation of the three Australian dialects: Broad, General, and Cultivated Australian, and published the formant frequencies for each vowel.

out of range or less than 120 Hz lower, this would result in a score of 2.5% and no points would be awarded for the test items' F2s if neither were correct.

FOOT and GOOSE vowel

Neither the FOOT /ʊ/ nor the GOOSE vowel /u:/ occur in Dutch. However, both English phonemes are very close to the Dutch MOE vowel /u/ in terms of phonetic space. This could explain why, according to Collins et al. (2001), many Dutch learners of English do not distinguish sufficiently between the FOOT and GOOSE vowel. However, similar pronunciation of /ʊ/ and /u:/ is clearly non-nativelike and results in accented speech. Based on the same studies that were mentioned above (Hillenbrand et al. 1995; Peterson & Barney 1952; Ferragne & Pellegrino 2010; Hawkins & Midgley 2005; Clermont 1996), the F1 of the FOOT vowel should range between 258 and 568 Hz and its F2 should be between 880 and 1747 Hz in order to possibly be considered native-like. Furthermore, the F1 of the FOOT vowel was predominantly higher than the F1 of the GOOSE vowel in all of the studies mentioned above, i.e. the FOOT vowel is more "open." The smallest difference was found in the data of the female native speakers of American English from Hillenbrand et al. (1995), namely 60 Hz. No such distinction could be made between the F2 of the FOOT and GOOSE vowels based on the data of those studies, simply because there was too much variation.

Using *Praat*, the participants' formant frequencies of the vowels in the test items could be determined. If the production of the FOOT vowel did not fall within the range of 258-568 Hz for the F1 and 880-1747 Hz for the F2, no points would be awarded. In order to be able to see whether or not the F1 of the FOOT vowel was indeed higher than that of the GOOSE vowel, two control items were inserted in the text containing the GOOSE vowel ("Luke" and "shoot"), which provided the formant frequency values needed to draw comparisons. If the pronunciation was within the previously determined range, and the F1 of the test item was at least 60 Hz higher than that of the control items, the participants would score 5% per test item. However, if the F1 for the test item was less than 60 Hz higher, but higher nonetheless, the participants would score 2.5%. Naturally, if the F1 of the test item was equal to or lower than the F1 of the control item, the participants would not score any points.

2.2.5 Results

Table 3 below presents the results of the pronunciation task. The mean score for the low exposure group was 53% (SD = 11.1) and the mean score for the high exposure group was

59.7% (SD = 9.9). An Independent Samples T-test indicated that the difference between the pronunciation task results of Group I and II is not significant (T = -1.742, Sig. 2-tailed = 0.092), as can be seen in Table 13 in Appendix B. However, a positive correlation (r = 0.377) was found between the amount of exposure to L2 media input and the pronunciation task results that is significant at the 0.05 level (2-tailed), indicating that the chance that media input does not influence pronunciation is less than 5% (see Table 14, Appendix B). This correlation is further illustrated by the scatterplot that can be found in Appendix B, Figure 8. Finally, no correlation was found between the participants' school grades and their pronunciation task results (r = 0.241), as Table 15 in Appendix B shows.

Group I	Score pron.	Group II	Score pron.
1	47.5%	16	52.5%
2	45.0%	17	60.0%
3	65.0%	18	57.5%
4	47.5%	19	60.0%
5	42.5%	20	75.0%
6	82.5%	21	62.5%
7	47.5%	22	65.0%
8	50.0%	23	75.0%
9	62.5%	24	57.5%
10	47.5%	25	60.0%
11	40.0%	26	55.0%
12	57.5%	27	40.0%
13	45.0%	28	42.5%
14	55.0%	29	65.0%
15	60.0%	30	67.5%
Mean	53.0%	**Mean**	59.7%
SD	11.1	**SD**	9.9

Table 3: Results pronunciation task

Tables 4, 5, and 6 show the results of the pronunciation task per test condition. Table 4 shows the results for the low exposure group, Table 5 for the high exposure group, and Table 6 for all participants combined. Figure 2 further illustrates the results for each test condition of the two groups combined. Moreover, Tables 25-34 in Appendix D present the data for each test item and each participant separately. In other words, all data and measurements collected from the pronunciation task of the present study can be found in Appendix D, organised per test condition.

Test conditions	Group I		
	Correct	In between	Incorrect
VOT	36.67%	30.0%	33.33%
No Final Devoicing	53.33%	N.A.	46.67%
/v/ ~ /f/	46.67%	N.A.	53.33%
/ð/ and /θ/	46.67%	N.A.	53.33%
/z/ ~ [s]	20.00%	N.A.	80.00%
Liprounding for /w/	90.00%	N.A.	10.00%
/ɹ/	93.33%	N.A.	6.67%
Vowel Length	30.00%	6.67%	63.33%
/æ/ ~ /ɛ/	26.67%	43.33%	30.00%
/ʊ/ ~ /u:/	26.67%	40.00%	33.33%

Table 4: Pronunciation task results per test condition for Group I (low exposure)

Test conditions	Group II		
	Correct	In between	Incorrect
VOT	50.00%	30.00%	20.00%
No Final Devoicing	70.00%	N.A.	30.00%
/v/ ~ /f/	60.00%	N.A.	40.00%
/ð/ and /θ/	63.33%	N.A.	36.67%
/z/ ~ [s]	33.33%	N.A.	66.67%
Liprounding for /w/	100.00%	N.A.	0.00%
/ɹ/	100.00%	N.A.	0.00%
Vowel Length	40.00%	10.00%	50.00%
/æ/ ~ /ɛ/	23.33%	20.00%	56.67%
/ʊ/ ~ /u:/	13.33%	26.67%	60.00%

Table 5: Pronunciation task results per test condition for Group II (high exposure)

The results for each of the test conditions in Table 4 and 5 reveal that the high exposure group outperformed the low exposure group on eight of the ten test conditions. Only when formant frequencies came into play did Group I perform more native-like than Group II.

The combined results of Group I and II are presented in Table 6 and Figure 2. They give an indication of the difficulty of each test item. The two test conditions that seem to have been least problematic were "liprounding for /w/" and the pronunciation of /ɹ/; the test items for these conditions were correctly pronounced in respectively 95% and 96.67% of the cases. Most difficult, apparently, were the correct pronunciations of /æ/ and /ʊ/; they were pronounced in a native-like manner only 25% and 20% of the time, respectively. Interestingly, these test conditions on which a majority of the participants performed poorly

were precisely the two test conditions on which the low exposure group's pronunciation was more native-like than the high exposure group. Further study would be required to explain this unexpected result. Furthermore, many of the participants seemed to be unaware of the difference in vowel length before voiced and voiceless consonants (56.67% incorrect) and most participants also struggled with the pronunciation of the grapheme "s" in non-final position when the condition demanded that it be realised as [z] (73.33% incorrect).

Test conditions	Overall		
	Correct	In between	Incorrect
VOT	43.33%	30.00%	26.67%
No Final Devoicing (FD)	61.67%	N.A.	38.33%
/v/ ~ /f/	53.33%	N.A.	46.67%
/ð/ and /θ/	55.00%	N.A.	45.00%
/z/ ~ [s]	26.67%	N.A.	73.33%
Liprounding for /w/	95.00%	N.A.	5.00%
/ɹ/	96.67%	N.A.	3.33%
Vowel Length (VL)	35.00%	8.33%	56.67%
/æ/ ~ /ɛ/	25.00%	31.67%	43.33%
/ʊ/ ~ /u:/	20.00%	33.33%	46.67%

Table 6: Pronunciation task results per test condition for Group I and II combined

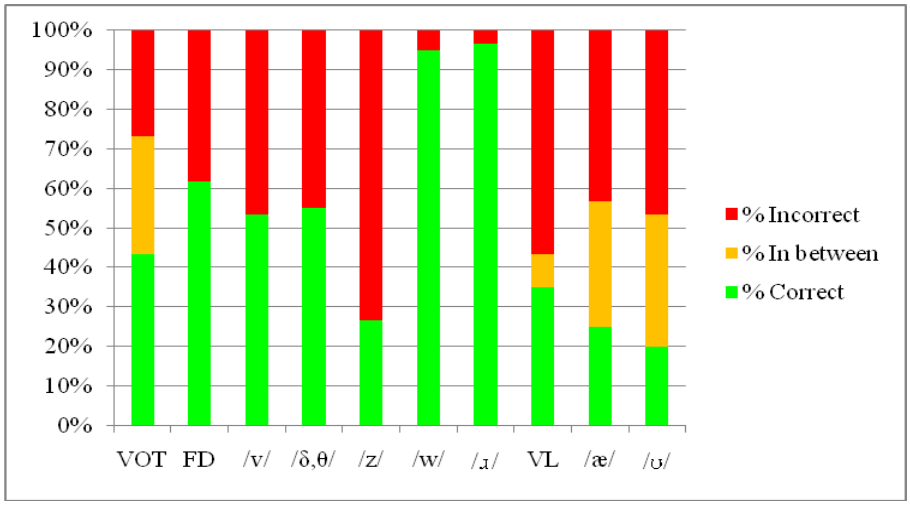

Figure 2: Pronunciation task results per test condition for Group I and II combined

2.2.6 Discussion

Surprisingly, the highest pronunciation score of 82.5% was not found in the high exposure group, but in the low exposure group. It belonged to a participant who indicated to be exposed to only 11 hours of English media input per week outside of the classroom. The lowest score

of 40% was found twice, once in each group. This means that one of the participants in the high exposure group performed most poorly out of all participants on the pronunciation task, even though this participant had indicated to receive over 23 hours of L2 media input on a weekly basis.

These unexpected individual results aside, the difference between the mean results for Group I and Group II did not prove to be significant. These findings seem to suggest that a large amount of L2 media exposure is not vital to pronunciation. Other factors appear to play an important role here, perhaps ones such as aptitude or interaction. The latter might therefore be of more importance than previously assumed, which is in line with the view of, for example, De Jong who, in Piske & Young-Scholten (2009), describes how "it seems that performance does not always readily generalize from comprehension training to production tasks, and therefore production skills seem to require separate practice. In short, input matters, but output matters too" (114). Even though De Jong refers to learning an L2 grammar in particular, the same could hold for acquiring an L2 phonology. Another interesting idea that could be related to the pronunciation problems found in the current experiment was proposed by Bohn & Bundgaard-Nielsen (2009) in Piske & Young-Scholten (2009) who explain that if, as is the case for the English media in the Netherlands, the TL input is very heterogeneous, this could lead to "some production problems in foreign language settings [...]. Further research should examine in more detail aspects of non-native speech when learners encounter a highly variable target" (218).

However, perhaps the figures for low and high exposure associated with the groups in the present study simply did not sufficiently differentiate. Consequently, it would be advisable for further studies to form a low exposure group consisting of participants receiving even less L2 media exposure than in the current study in order to possibly find a significant difference.

Nonetheless, although the difference between the low exposure group and the high exposure group in terms of their pronunciation task results was not significant, the fact that a positive correlation has been found between the amount of exposure and the pronunciation score does suggest that exposure to L2 media benefits L2 pronunciation. Perhaps with a different low exposure group formation, a larger number of participants, or with a different method for testing pronunciation, the difference between the two groups would be significant. At least, this seems a reasonable assumption given the positive correlation that was found. Again, further research with different or larger test groups or other experimental methods would have to resolve the discrepancy that was found in the current study.

Looking at the results for the separate test conditions of the pronunciation task, it can be concluded that certain aspects of the participants' L1 seemed to be transferred more readily than others. The only two conditions that did not appear to pose a problem to the participants were "liprounding for /w/" and the pronunciation of the alveolar approximant /ɹ/. Most difficult for the participants were pronouncing [z] instead of [s] in non-final position, vowel length before voiced and voiceless consonants, and the pronunciation of /æ/ and /ʊ/. A number of factors could cause this difference in difficulty. Even though, as for example Ioup & Weinberger (1987) and Young-Scholten (1996) report, "the phonology research indicates that L2 learners retain into adulthood the capacity to unconsciously develop a second phonology" (Piske & Young-Scholten 20), perhaps some aspects from the L2 phonology that differ from the L1 are more salient than others, or perhaps some non-native phonemes or phonologic rules are more difficult to learn after the critical period. To determine what causes these differences would take an entirely different study, however.

When comparing the pronunciation task results to the participants' school grades for English, it becomes clear that there is no correlation between the two. Ergo, the participants who did really well in school did not necessarily have a more native-like pronunciation than those with a lower school grade and vice versa. The lack of a relationship here is not entirely unexpected, however, as pronunciation only constitutes a small part of the English curriculum in Dutch secondary schools and thus only determines a small portion of the school grade. It might be interesting to, in another study, filter out the school grades based on pronunciation alone and compare these to the pronunciation task scores. However, even this could still fail to reveal any correlation, since, generally in secondary schools, intelligibility, fluency, and use of grammar and vocabulary often outweigh the importance of a native-like pronunciation. In other words, the communicative effect is often considered more important than accuracy (cf. Trimbos 6-7).

In short, what is most relevant to the current study is that the pronunciation task was predicted to disclose fewer instances of negative transfer from Dutch in the L2 English pronunciation of the high exposure group than of the low exposure group. On average, Group II indeed performed better on this criterion than Group I, however, not significantly so. The most important pronunciation task result regarding the present study is, therefore, that no significant difference was found between the low and high exposure group. Nevertheless, a positive correlation does exist between amount of L2 media input and the pronunciation task

score, suggesting that exposure to L2 media input is beneficial to native-like L2 pronunciation.

2.3 Quick Placement Test

2.3.1 Methodology

In order to determine the general English language proficiency level of the participants, they were asked to complete the CD-ROM version of the QPT, which, based on around twenty multiple choice questions, assesses listening, reading, vocabulary, and grammar. The results are expressed as a score out of 100 and presented in terms of the ALTE levels from 0 to 5, which correspond with the Common European Framework of Reference levels (CEFR levels) and Cambridge ESOL Examination levels as indicated in Table 7.

QPT Score	ALTE Level	CEFR Level	CEFR Description	ESOL Level
80 – 100	5	C2	Mastery	Upper Advanced
70 – 79	4	C1	Effective Proficiency	Lower Advanced
60 – 69	3	B2	Vantage	Upper Intermediate
50 – 59	2	B1	Threshold	Lower Intermediate
40 – 49	1	A2	Waystage	Elementary
30 – 39	0.5	A1	Breakthrough	Breakthrough
0 – 29	0	-	-	Beginner

Table 7: Look-up table for QPT scores (*QPT Manual* 43)

The QPT is a quicker and computerised version of the Oxford Placement Test, which is acclaimed in the literature as a reliable means for testing general language proficiency of students at all levels (Griffiths 65). Moreover, Allen (1995), as quoted by Griffiths (2003), claims that "it has been shown to be highly reliable as well as relatively quick and convenient" (Griffiths 64). Therefore, the QPT is considered to be an appropriate method to determine the general L2 proficiency of the participants for the current study.

2.3.2 Materials

The QPT consists of five different types of multiple choice questions. The first question type involves a sound fragment that can be played and listened to twice. The participant has to choose the one image out of four that answers the question according to what they hear in the

fragment. For an example question, see (1) below. A picture of the corresponding computer screen is included in Figure 3.

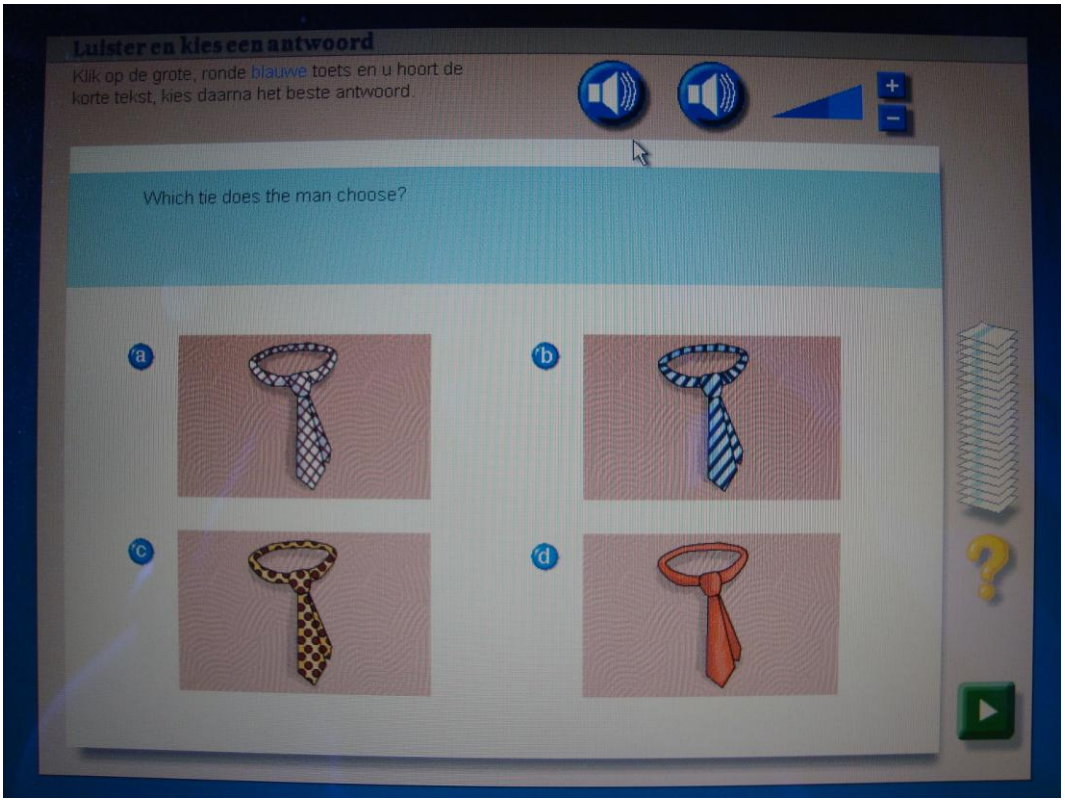

Figure 3: "Which tie does the man choose?"

1) *Question:* "Which tie does the man choose?"

   Sound fragment transcript:

   MALE VOICE "Which tie shall I wear for the interview? Do you think my blue silk one would look alright?"

   FEMALE VOICE "A bit boring. I'd wear something with a small pattern; squares or spots, something like that!"

   MALE VOICE "Oh, I don't know! I think I'll wear the plain one."

   Answer options:

   a. Picture of a white tie with red squares
   b. Picture of a light blue tie with dark blue stripes
   c. Picture of a yellow tie with red spots
   d. Picture of a plain red tie

The second question type is similar to the first in also including sound fragments which can be listened to twice. However, in these questions, the participant has to choose from written answers instead of pictures, as can be seen in Figure 4 and example (2) below.

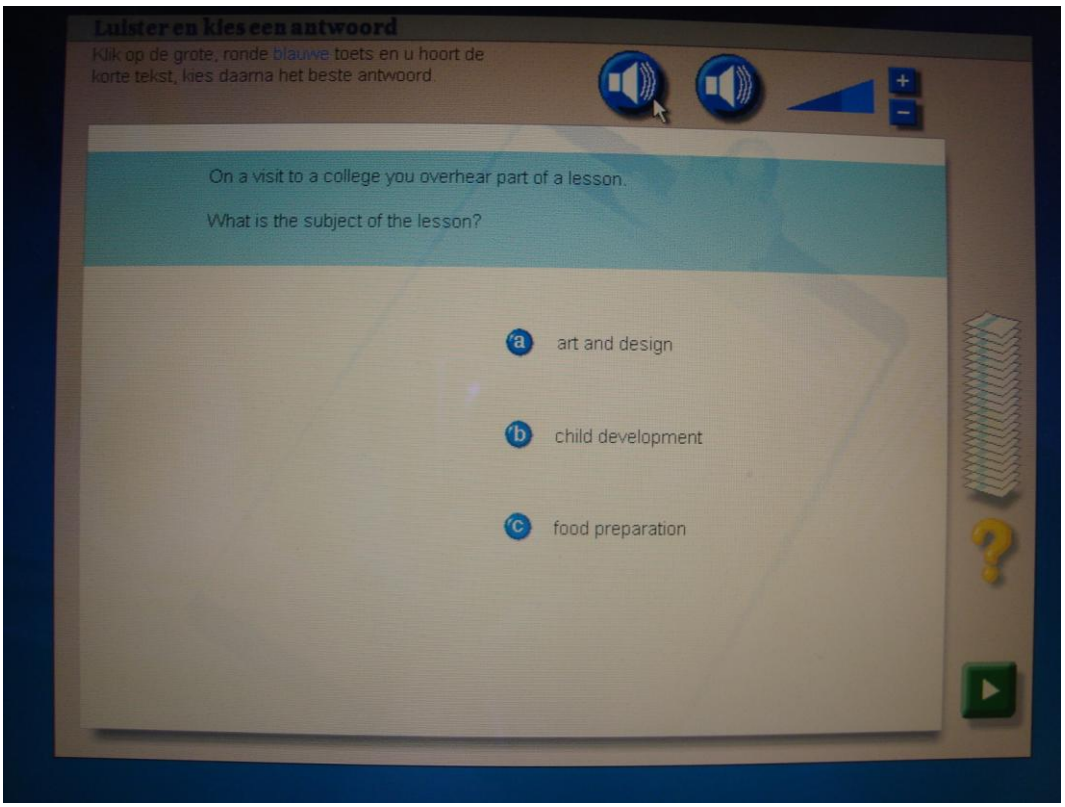

Figure 4: "What is the subject of the lesson?"

2) *Question:* "On a visit to a college you overhear part of a lesson. What is the subject of the lesson?"

Transcript of sound fragment:

"When you're very young, eating is a hands-on experience. Food is not just a matter of taste and smell, it's feel too. Babies learn by feeling things. It's a way of double-checking on what their eyes can see. So, next time your baby sister splatters you with her dinner, remember it's all part of the learning experience!"

Answer options:

a. art and design
b. child development
c. food preparation

The third question type is a reading task and involves a picture about which four statements are made out of which the participant has to choose the single correct one. An example is provided in (3) below, as well as in Figure 5.

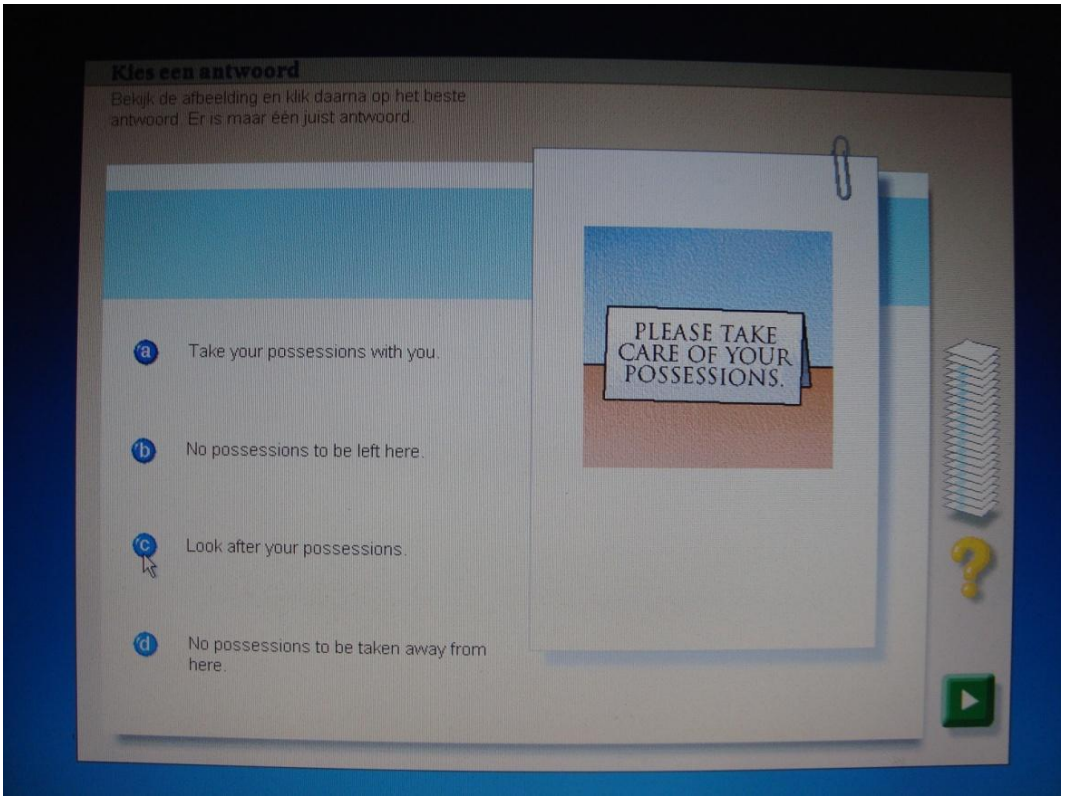

Figure 5: "Please take care of your possessions."

3) *Picture:* A sign with the text “Please take care of your possessions.”
Answer options:
   a. Take your possessions with you.
   b. No possessions to be left here.
   c. Look after your possessions.
   d. No possessions to be taken away from here.

The fourth question type has a cloze test format. The participant is presented with a sentence in which a word is missing and has to choose which of the four possible answers should fill the gap. Cloze tests require the ability to understand context and vocabulary in order to identify the correct words or type of words that belong in the deleted passages of a text. The *QPT Manual* describes these particular questions as testing “core competence, as

they cannot be linked to any particular skill" (5). An example of such a question, as it occurs in the QPT, is presented in (4) below. A visual representation of this question is included in Figure 6.

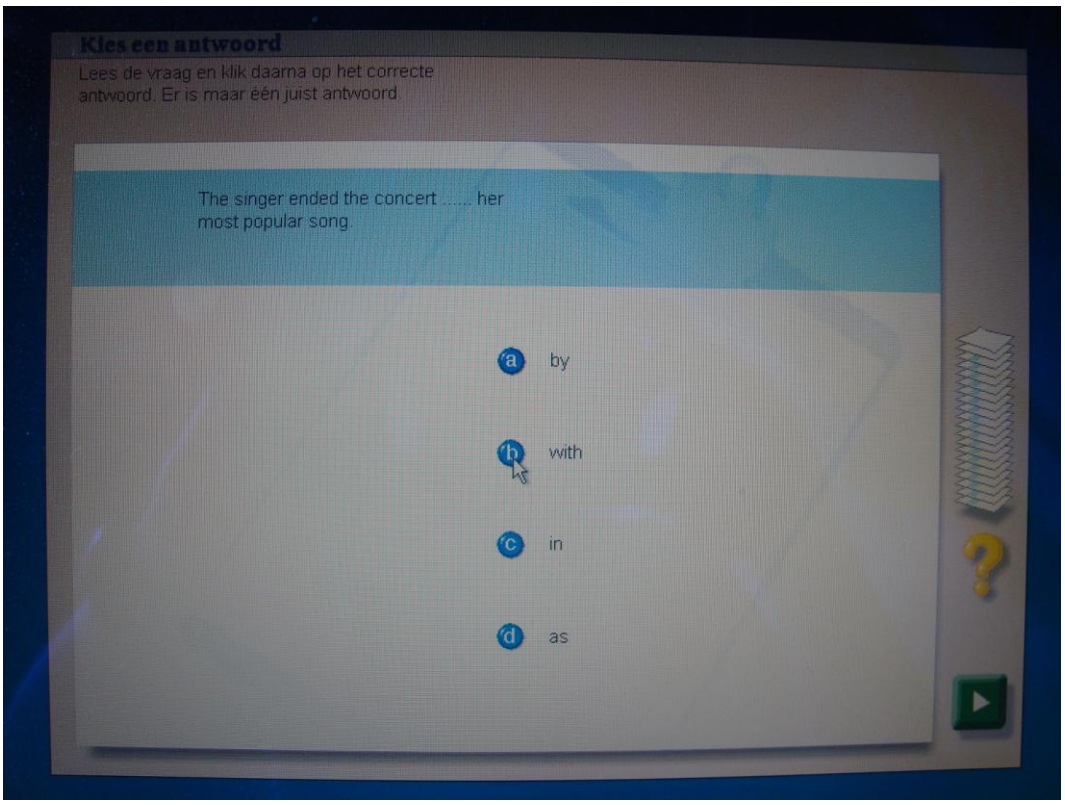

Figure 6: Fill in the gap

4) *Test sentence:* "The singer ended the concert ... her most popular song."
   Answer options:
   a. by
   b. with
   c. in
   d. as

The final question type also has a multiple-choice cloze format, but of a more elaborate kind than the fourth question type. This time, the participant is presented with a short text containing several gaps. When the participant clicks on a gap, four answer options appear from which the participant has to identify the only correct one. The *QPT Manual* also

describes this question type as testing the participant's "core competence." An example of such a text is given in (5) below, as well as in Figure 7.

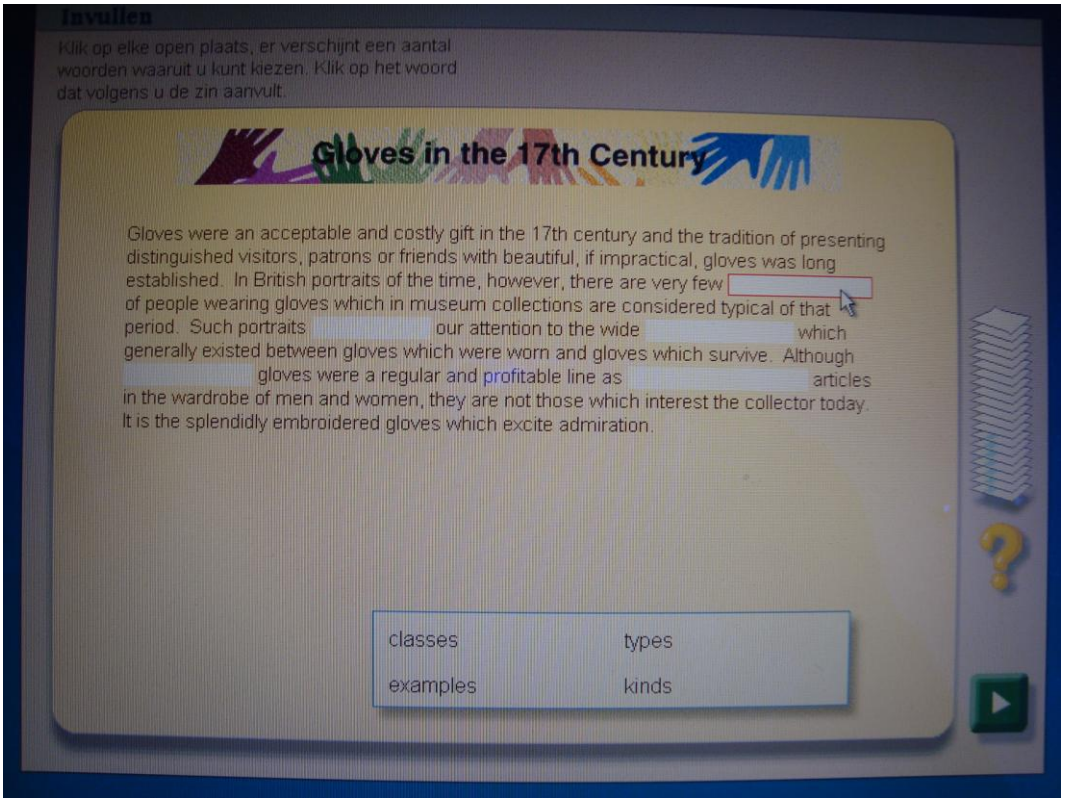

Figure 7: "Gloves in the 17th Century"

5) *Title:* "Gloves in the 17th Century"

Text: "Gloves were an acceptable and costly gift in the 17th century and the tradition of presenting distinguished visitors, patrons or friends with beautiful, if impractical, gloves was long established. In British portraits of the time, however, there are very few ... of people wearing gloves which in museum collections are considered typical of that period. Such portraits ... our attention to the wide ... which generally existed between gloves which were worn and gloves which survive. Although ... gloves were a regular and profitable line as ... articles in the wardrobe of men and women, they are not those which interest the collector today. It is the splendidly embroidered gloves which excite admiration."

Answer options first gap:

classes / types / examples / kinds

2.3.3 Procedure

The participants performed the QPT in the same sitting as the pronunciation task. Importantly though, they had to do the pronunciation task first, so as not to be influenced by the aural input they received in the QPT. Then, they were allowed to take a short break to relax before doing the QPT.

During the QPT, the participants sat facing the computer screen and the experimenter sat next to them or behind them to ensure the test was running smoothly, but the experimenter did not sit too close to the participants, because having someone 'watching over their shoulder' could have made them feel uncomfortable. The experimenter did not have to give instructions about the QPT, because the programme had its own instructions before the actual test started. These instructions were presented aurally and visually to the participant in their native language (Dutch) on the computer screen and through the earphones. The experimenter's role, then, was limited to checking whether the programme and the earphones worked properly and that the participants were comfortable with the task.

The results were not shown to the participants upon completing the QPT. Instead, on their screen they were instructed to ask the experimenter about their result in case they were interested in knowing their English language proficiency level. If this was the case, the experimenter would enter the supervisor mode of the QPT and consult the participants' scores and ALTE levels and give feedback to the participants.

2.3.4 Analysis

The number of questions presented to each participant varied, depending on their language proficiency. The level of difficulty of the questions adjusted automatically to the proficiency level of the participant. This is what the *QPT Manual* calls "computer-adaptive testing", meaning that "[a]s the test proceeds the computer estimates the ability of the test taker and chooses items which are of the right difficulty for that level" (6). By varying the difficulty of the test questions, the exact level of language proficiency could be determined. When questions were answered correctly, the difficulty increased and vice versa until a steady level could be determined, which was representative of the proficiency level of the participant. This process required approximately twenty questions; less for some participants and more for others.

The QPT analysed the test results automatically and expressed them, as mentioned earlier, in terms of a numerical score out of 100 points and the corresponding ALTE level.

The eventual score out of 100 did not imply that the participant had that percentage of answers right; the adaptive test also takes into account the level of difficulty of the test items that were attempted. Based on these two variables, the adaptive test estimated the participant's ability. The QPT therefore allowed for giving different participants entirely different sets of test items whilst still estimating their proficiency level on the same scale (6). Yet, it is important to note that the *QPT Manual* reports its test results to have a margin of error of + or – 4 points on the 100-point scale, which means that about seven out of ten participants' scores will be within the range of their "true score" + or – 4 (43).

Unfortunately, the software did not offer the possibility to assess the different language skills separately. It therefore provided only a general assessment of the participants' L2 proficiency. Nonetheless, this should prove sufficient for the purpose of this thesis, since the aim was to compare the overall L2 proficiency levels of the low exposure group with the high exposure group.

2.3.5 Results

The results of the QPT are presented in Table 8 below. The mean score for the low exposure group was 50.8 (SD = 5.3) out of a possible 100 and for the high exposure group 56.7 (SD = 7.7). The mean ALTE level of Group I was 1.5 (SD = 0.6), which means that the low exposure group, on average, was somewhere between CEFR levels A2, i.e. Waystage (Elementary), and B1, i.e. Threshold (Lower Intermediate) at the time of testing. The mean ALTE level of Group II was 2.2 (SD = 0.9), indicating that the high exposure group on average was somewhere between CEFR levels B1 and B2, i.e. Vantage (Upper Intermediate). Based solely on the mean scores of both groups though, both would have to be classified to have been at the Threshold (Lower Intermediate) level (cf. Table 7).

Although both the low exposure and high exposure group's mean scores belonged in the category of ALTE level 2, the difference between their QPT results was found to be significant, both in terms of the QPT score (T = -2.436, Sig. 2-tailed = 0.021), as can be seen in Table 16 in Appendix B, as in terms of the ALTE levels (T = -2.405, Sig. 2-tailed = 0.023), as illustrated in Table 17, Appendix B. These tables in the appendix present the results of Independent Samples T-tests. Also, a positive correlation (r = 0.404) has been found between the amount of exposure and the QPT results that is significant at the 0.05 level (2-tailed). The chance, therefore, that the amount of L2 media exposure does not influence the QPT results is less than 5%. This correlation can be seen in Table 18 in Appendix B, as well as in its

accompanying scatterplot in Figure 9, which is also presented in Appendix B. Strikingly, the participants' L2 proficiency levels do not seem to be reflected in their school grades, since no correlation was found between their grades and QPT results (r = 0.015), as is shown in Table 19, Appendix B.

Group I	QPT Score	ALTE Level
1	48	1
2	52	2
3	47	1
4	53	2
5	40	1
6	52	2
7	57	2
8	49	1
9	47	1
10	48	1
11	49	1
12	58	2
13	54	2
14	47	1
15	61	3
Mean	50.8	1.5
SD	5.3	0.6

Group II	QPT Score	ALTE Level
16	44	1
17	54	2
18	45	1
19	60	3
20	58	2
21	56	2
22	52	2
23	63	3
24	55	2
25	66	3
26	71	4
27	65	3
28	48	1
29	55	2
30	58	2
Mean	56.7	2.2
SD	7.7	0.9

Table 8: QPT results

2.3.6 Discussion

The prediction for the QPT was that the high exposure group would perform better than the low exposure group, i.e. that the participants who received more L2 media input would, on average, be more proficient with regards to English vocabulary, grammar, listening, and reading. This prediction appears to have borne out. Group II did have a higher mean score and ALTE level and the difference with Group I was significant. Also, a positive correlation was found between the amount of L2 media input and the QPT score.

As mentioned in the introduction to this thesis, there is a large amount of individual variation in the proficiency level of secondary school pupils who are in the same year and at the same educational level. Accordingly, in the present study, some of the participants' proficiency barely reached ALTE level 1 (CEFR level A2), which, in terms of the CEFR, means that they:

> [c]an understand sentences and frequently used expressions related to areas of most immediate relevance (e.g. very basic personal and family information, shopping, local geography, employment). Can communicate in simple and routine tasks requiring a simple and direct exchange of information on familiar and routine matters. Can describe in simple terms aspects of his/her background, immediate environment and matters in areas of immediate need, (*QPT Manual* 45)

whereas others are already (nearly) at ALTE level 4, i.e. CEFR level C1, which means that they, according to the CEFR:

> [c]an understand a wide range of demanding, longer texts, and recognise implicit meaning. Can express [themselves] fluently and spontaneously without much obvious searching for expressions. Can use language flexibly and effectively for social, academic and professional purposes. Can produce clear, well-structured, detailed texts on complex subjects, showing controlled use of organisational patterns, connectors and cohesive devices. (*QPT Manual* 45)

Taking into consideration that all participants could have been classmates at the time of testing,[5] the individual differences in L2 proficiency make teaching these pupils a real challenge. As was said before, large differences between the pupils' proficiency levels make it hard to determine a pace and curriculum to benefit and motivate everyone. Unfortunately, the QPT's output does not reveal results for the separate L2 skills of vocabulary, grammar, listening, and reading. This renders it impossible to determine which skills should be targeted more in school. Future research might want to focus on the proficiency level for each L2 skill separately in order to determine what can be done in secondary school English education to improve and perhaps even equalise the pupils' proficiency.

Furthermore, since the QPT has been reported to provide a reliable indication of general L2 proficiency, it may be called disturbing to find that there is no correlation between the participants' school grades and their QPT scores. The fact that there is no correlation between these two factors could mean that either the QPT results or the school grades do not present a realistic image of the L2 proficiency. It does seem rather curious, for instance, that one of the participants of the present study who scored 66 points on the QPT and is at ALTE level 3 has not even received a sufficient mark for English in school, namely a 4.9 out of 10, where 5.5 and up would indicate a sufficient mark. In further studies, therefore, it could be

[5] In fact, all participants were selected from four different second-year VWO classes at the same secondary school.

interesting to scrutinise the way the school grades are determined and whether or not they provide a good representation of the pupils' L2 proficiency. If not, this could be reason to change the English curriculum and/or testing methods in Dutch secondary schools. However, it must be taken into account that school grades are affected by many other factors besides proficiency; motivation and effort probably being two of the most important ones.

Briefly put, the major conclusion in light of the current study is that, as expected, the amount of L2 media input does influence the QPT results, since a significant difference was found between the QPT results of the low and high exposure group, as well as a positive correlation between the amount of input and the QPT scores. Still, some of the results of the present study do seem to have relevant implications for the education of English as an L2 in Dutch secondary schools and are therefore worth mentioning and should advisably be the subject of further research.

2.4 Combined results

2.4.1 Pronunciation task and QPT results combined

Since both tasks described so far resulted in a score out of 100, averaging these two scores was the most convenient manner to determine an 'overall' result. For example, the combined score for participant 1 is 47.75% based on her pronunciation task result of 47.5% and QPT score of 48. Table 9 below presents the combined score for all participants. The separate scores for the pronunciation task were presented in Table 3 (§2.2.5) and for the QPT in Table 8 (§2.3.5).

As can be seen in Table 9, the mean combined score for the low exposure group was 51.93% (SD = 6.52) and 58.17% (SD = 6.62) for the high exposure group. This difference between the combined results of Group I and Group II is significant (T = -2.610, Sig. 2-tailed = 0.014), as can be seen in Table 20, Appendix B. Also, a correlation (r = 0.484) has been found between the amount of L2 media exposure and the combined results that is significant at the 0.01 level (2-tailed), which indicates that the chance that the quantity of L2 media exposure does not influence the combined result is less than 1%. This correlation can be seen in Table 21, as well as in its accompanying scatterplot in Figure 10, both of which are presented in Appendix B.

No correlations were found between the participants' school grades and the combined results (r = 0.189), nor between their age and combined results (r = 0.077), nor between their

gender and combined results (r = 0.071). The accompanying tables for these correlations, Tables 22, 23, and 24 respectively, can be found in Appendix B.

Group I	Combined score	Total exp. (h/w)	Grade
1	47.75%	7	5.7
2	48.50%	7.5	5.7
3	56.00%	5.75	5.8
4	50.25%	7	5.5
5	41.25%	11	6.5
6	67.25%	11	7.2
7	52.25%	9.5	4.8
8	50.00%	12	5.6
9	54.75%	8	7.8
10	47.75%	12.5	7.2
11	44.50%	5.25	5.1
12	57.75%	10.25	6.7
13	49.50%	5.75	5.7
14	51.00%	4.75	7.5
15	60.50%	9.25	6.2
Mean	51.93%	8.4	6.2
SD	6.52	2.5	0.9

Group II	Combined score	Total exp. (h/w)	Grade
16	48.25%	40.5	5.0
17	57.00%	45.5	6.1
18	51.25%	21	5.3
19	60.00%	29.5	6.3
20	66.50%	37	6.5
21	59.25%	28	6.1
22	58.50%	21	5.8
23	69.00%	44	7.0
24	56.25%	21	4.6
25	63.00%	32	4.9
26	63.00%	34.5	6.8
27	52.50%	23.25	6.6
28	45.25%	35	7.4
29	60.00%	25	5.5
30	62.75%	50	6.9
Mean	58.17%	32.5	6.1
SD	6.62	9.5	0.8

Table 9: Combined scores of the pronunciation task and QPT

2.4.2 Discussion

The participants' overall language proficiency was determined by combining the results of the pronunciation task and the QPT. Future studies may want to include the participants' L2 writing skills and other aspects of their L2 speaking skills besides pronunciation in order to provide an even more complete view of the participants' general L2 proficiency. Given the L2 aspects that were tested in the present study, namely vocabulary, grammar, listening, reading, and pronunciation, the results were expected to show a higher proficiency level for L2 learners who have been and/or are exposed to larger amounts of L2 media input. In other words, the participants in Group II were expected to display a higher level of general L2 proficiency, as was the outcome of the QPT, as well as have less accented L2 speech. For the latter, however, no significant difference between Group I and II was found, as was discussed in §2.3.5 and §2.3.6.

For the combined results of the two tasks in the present study, the high exposure group was expected to perform significantly more native-like than the low exposure group, based on

the fact that its participants were exposed to larger quantities of English input from the media. This prediction seems to have borne out, since a significant difference was found between the combined results of Group I and Group II. Moreover, a positive correlation was found between the amount of input and the combined results.

As was the case for the separate tasks of the present study, there is also no correlation between the participants' school grades and their combined results. The questions that were raised before about how the school grades are determined therefore still appear to be relevant and could inspire further research.

In order to rule out any age or gender effect, it had to be checked whether any correlations existed between these variables and the combined results of the two tasks. No such correlations were found and the group formation therefore does not seem to have influenced the results in any undesired way.

To sum up, the predictions about the combined result of the two tasks seem to have borne out, because there was a significant difference between the results of both groups. Additionally, a positive correlation was found between the amount of exposure to L2 media input and the combined results. These findings seem to provide evidence to support the hypothesis that exposure to L2 media input positively affects L2 proficiency.

3 SUMMARY AND CONCLUSION

The present study aimed to find out whether or not exposure to L2 media input benefits L2 proficiency. It was hypothesised that a larger quantity of exposure leads to a higher proficiency level. In order to test this hypothesis, two groups of Dutch secondary school pupils with a mean age of 14;2 and with a similar background regarding L2 English instruction were tested. All participants in the first group received less than 14 hours of English media input per week, with a mean of 8.4 hours, and all participants in the second group received over 21 hours of English media input per week, with a mean of 32.5 hours.

All participants were asked to perform two tasks, namely a pronunciation task and the QPT. The combined results of these two tasks were considered to provide a reliable indication of the general L2 proficiency of the participants. Based on the experimental hypothesis, the high exposure group was expected to outperform the low exposure group significantly on both tasks, because, since they received more input, they were therefore expected to be more proficient in the L2.

The predictions seem to have partly borne out. A significant difference was found between the high exposure group and low exposure group's QPT results, as well as between their combined results of the two tasks. Also, positive correlations were found between the amount of exposure to L2 media input and the outcomes of the pronunciation task, QPT, and the two tasks combined. However, the difference between the results of the two groups on the pronunciation task was not significant. Nonetheless, considering the fact that the results of the pronunciation task did positively correlate with the amount of exposure to L2 media input, it does seem fair to conclude that the hypothesis appears to be true and that exposure to English media input does positively affect L2 proficiency. Perhaps if a larger group of participants were tested, or if the low exposure group had consisted of participants who received even less L2 media exposure, or if a different pronunciation test were used, the difference between the group results would have been significant. The surprising pronunciation task results could also be due to other factors, such as for example aptitude and interaction. Especially the latter seems to be of more relevance than previously assumed in the present study. Further research would be necessary to determine whether this is indeed the case.

The outcome of the present study may bear on the contents and form of English classroom instruction in Dutch secondary schools, or the way success and progress in an English language programme are being assessed: in the course of the investigation, it was

found that the participants' school grades did not correlate with the amount of L2 media input, the pronunciation task results, the QPT scores, nor with the combined results of the two tasks. Assuming the reliable character of a well-established and serious language test such as the QPT, the conclusion has to be drawn that the school grades do not seem to provide a reliable representation of the participants' proficiency level. Of course, it has to be taken into consideration that there are other factors influencing the school grades besides language proficiency, such as motivation and effort. It could therefore be interesting to further study the effects of other factors on the school grade and what could be done to better reflect the secondary school pupils' actual L2 proficiency in their grades.

In sum, although exposure to more L2 media input does not necessarily result in better secondary school grades, it does appear, based on the results of the present study, to improve the general L2 proficiency with regards to vocabulary, grammar, reading, listening, and, most likely, also native-like pronunciation.

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APPENDICES

A Amount of exposure to different types of media specified

Group I	Total exp/wk (in hours)	TV	Film	Music	Internet	Games	Other
1	7	4	1	2	0	0	0
2	7.5	3	1	3	0	0.5	0
3	5.75	4	1.75	0	0	0	0
4	7	1	2.5	3	0	0.5	0
5	11	1	1	6	1	1	1
6	11	1.5	2.25	6.5	0.25	0	0.5
7	9.5	1	0	1	2.5	3	2
8	12	2	1.5	2.5	4.5	1.5	0
9	8	0	0	3	5	0	0
10	12.5	3	4	3.5	2	0	0
11	5.25	0.75	0.5	3	1	0	0
12	10.25	5.5	3	1.75	0	0	0
13	5.75	2	2	1.5	0	0.25	0
14	4.75	0.75	2	2	0	0	0
15	9.25	1.5	0	7.25	0.5	0	0
Sum	126.5	31	22.5	46	16.75	6.75	3.5
Mean	8.4	2.1	1.5	3.1	1.1	0.45	0.2
SD	2.5	1.5	1.2	2.0	1.7	0.8	0.6

Group II	Total exp/wk (in hours)	TV	Film	Music	Internet	Games	Other
16	40.5	14	3.5	14	7	2	0
17	45.5	11	19	15.5	0	0	0
18	21	5	5	9.5	1.5	0	0
19	29.5	7	6	16.5	0	0	0
20	37	12.5	8.5	12	4	0	0
21	28	5	3	18	1	1	0
22	21	5	5	6	3.5	1.5	0
23	44	8	0	20	0	16	0
24	21	6	0	1	6	8	0
25	32	4	5	23	0	0	0
26	34.5	10.5	2	14	2	6	0
27	23.25	8	6.25	9	0	0	0
28	35	0	6	14	4	11	0
29	25	5	0	5	8	6	1
30	50	6	4	16	11	11	0
Sum	487.25	107	73.25	193.5	48	62.5	1
Mean	32.5	7.1	4.9	12.9	3.2	4.2	0.1
SD	9.5	3.6	4.7	5.9	3.5	5.2	0.3

Table 10: Amount of exposure to different types of media specified in hours per week

B Statistical analyses

i) Amount of exposure

Group		N	Mean	Std. Deviation	Std. Error Mean
Exposure	Group 1 (low exp.)	15	8,4333	2,54682	,65759
	Group 2 (high exp.)	15	32,4833	9,52462	2,45925

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
		Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower
Exposure	Equal variances assumed	19,043	,000	-9,448	28	,000	-24,05000	2,54565	-29,26452	-18,83548
	Equal variances not assumed			-9,448	15,992	,000	-24,05000	2,54565	-29,44675	-18,65325

Table 11: Significance of the difference between the amount of exposure of Group I and Group II

		Exposure	Grade
Exposure	Pearson Correlation	1	,093
	Sig. (2-tailed)		,626
	N	30	30
Grade	Pearson Correlation	,093	1
	Sig. (2-tailed)	,626	
	N	30	30

Table 12: Correlation between amount of exposure and school grade

ii) Pronunciation task results

	Group	N	Mean	Std. Deviation	Std. Error Mean
Pron.score	Group 1 (low exp.)	15	53,000	11,0680	2,8577
	Group 2 (high exp.)	15	59,667	9,8591	2,5456

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
		Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower
Pron.score	Equal variances assumed	,406	,529	-1,742	28	,092	-6,6667	3,8271	-14,5062	1,1728
	Equal variances not assumed			-1,742	27,634	,093	-6,6667	3,8271	-14,5108	1,1775

Table 13: Significance of the difference between the results of the pronunciation task of Groups I and II

		Exposure	Pron.score
Exposure	Pearson Correlation	1	,377(*)
	Sig. (2-tailed)		,040
	N	30	30
Pron.score	Pearson Correlation	,377(*)	1
	Sig. (2-tailed)	,040	
	N	30	30

* Correlation is significant at the 0.05 level (2-tailed).

Table 14: Correlation between amount of exposure and pronunciation task results

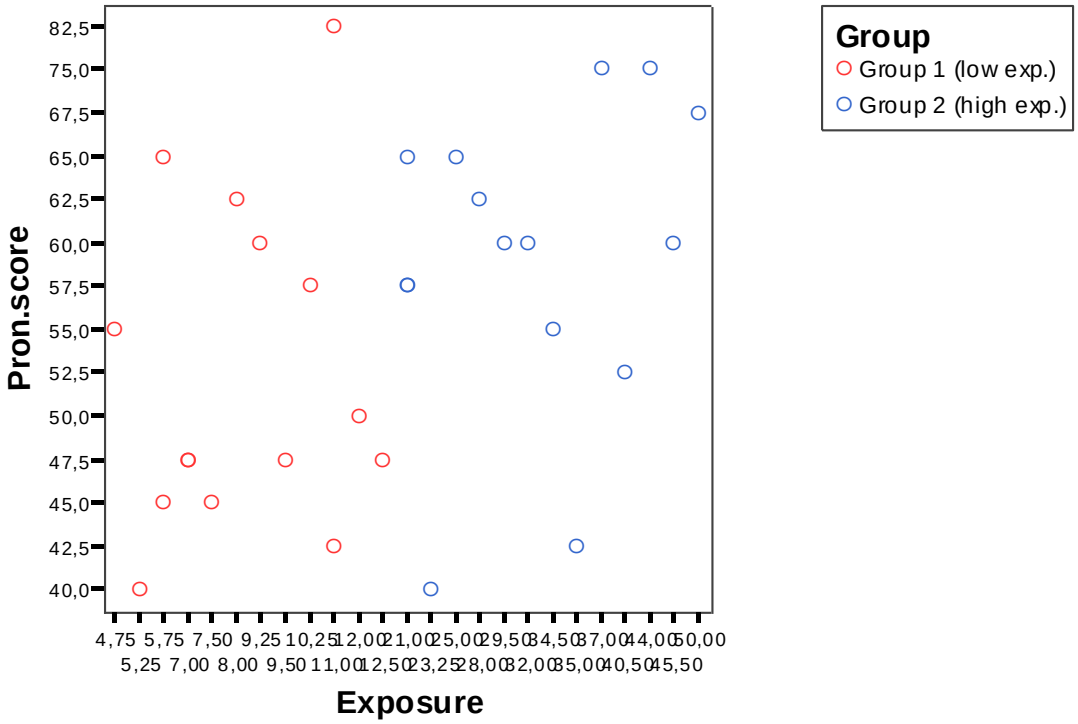


Figure 8: Scatterplot illustrating the correlation between amount of exposure and pronunciation task results

		Grade	Pron.score
Grade	Pearson Correlation	1	,241
	Sig. (2-tailed)		,199
	N	30	30
Pron.score	Pearson Correlation	,241	1
	Sig. (2-tailed)	,199	
	N	30	30

Table 15: Correlation between school grade and pronunciation task results

iii) QPT results

	Group	N	Mean	Std. Deviation	Std. Error Mean
QPTscore	Group 1 (low exp.)	15	50,80	5,308	1,370
	Group 2 (high exp.)	15	56,67	7,669	1,980

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
		Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower
QPTscore	Equal variances assumed	1,450	,239	-2,436	28	,021	-5,867	2,408	-10,799	-,934
	Equal variances not assumed			-2,436	24,909	,022	-5,867	2,408	-10,827	-,906

Table 16: Significance of the difference between the QPT scores of Groups I and II

	Group	N	Mean	Std. Deviation	Std. Error Mean
ALTElevel	Group 1 (low exp.)	15	1,53	,640	,165
	Group 2 (high exp.)	15	2,20	,862	,223

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
		Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower
ALTElevel	Equal variances assumed	,435	,515	-2,405	28	,023	-,667	,277	-1,234	-,099
	Equal variances not assumed			-2,405	25,838	,024	-,667	,277	-1,237	-,097

Table 17: Significance of the difference between the ALTE levels of Groups I and II

		Exposure	QPTscore
Exposure	Pearson Correlation	1	,404(*)
	Sig. (2-tailed)		,027
	N	30	30
QPTscore	Pearson Correlation	,404(*)	1
	Sig. (2-tailed)	,027	
	N	30	30

* Correlation is significant at the 0.05 level (2-tailed).

Table 18: Correlation between amount of exposure and QPT results

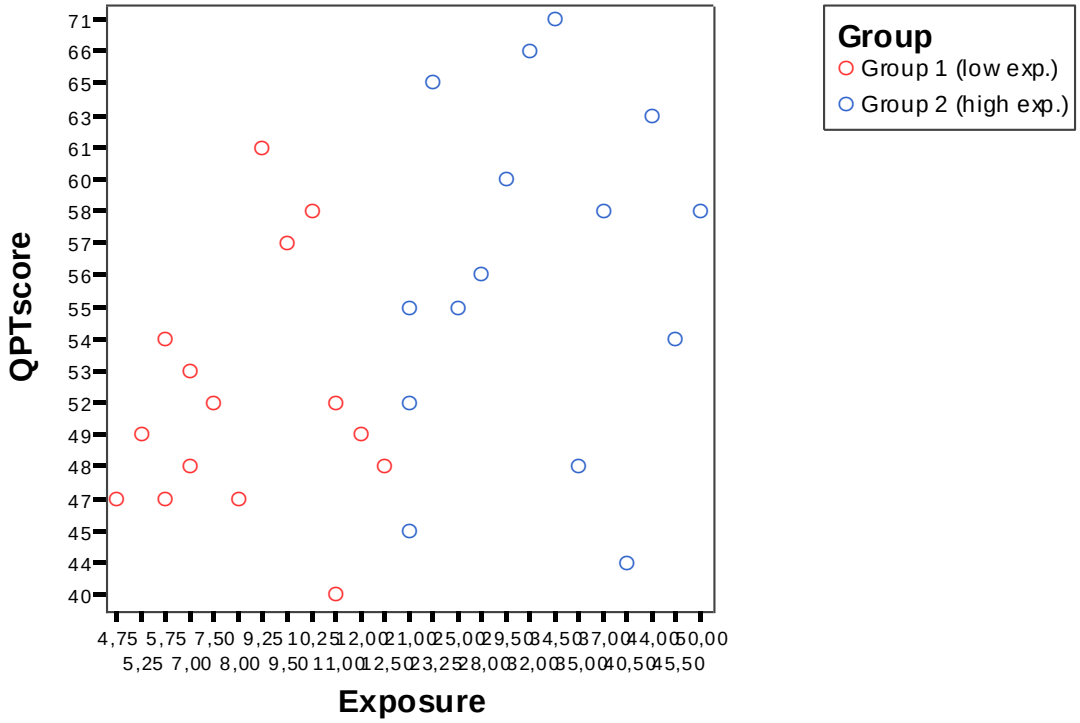


Figure 9: Scatterplot illustrating the correlation between amount of exposure and QPT results

		Grade	QPTscore
Grade	Pearson Correlation	1	,015
	Sig. (2-tailed)		,937
	N	30	30
QPTscore	Pearson Correlation	,015	1
	Sig. (2-tailed)	,937	
	N	30	30

Table 19: Correlation between school grade and QPT results

iv) Combined results

	Group	N	Mean	Std. Deviation	Std. Error Mean
CombinedScore	Group 1 (low exp.)	15	51,9000	6,53616	1,68763
	Group 2 (high exp.)	15	58,1667	6,61550	1,70812

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
		Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower
Combined Score	Equal variances assumed	,016	,899	-2,610	28	,014	-6,26667	2,40120	-11,18530	-1,34803
	Equal variances not assumed			-2,610	27,996	,014	-6,26667	2,40120	-11,18533	-1,34800

Table 20: Significance of the difference between the combined results of Groups I and II

		Exposure	CombinedScore
Exposure	Pearson Correlation	1	,484(**)
	Sig. (2-tailed)		,007
	N	30	30
CombinedScore	Pearson Correlation	,484(**)	1
	Sig. (2-tailed)	,007	
	N	30	30

** Correlation is significant at the 0.01 level (2-tailed).

Table 21: Correlation between amount of exposure and combined results

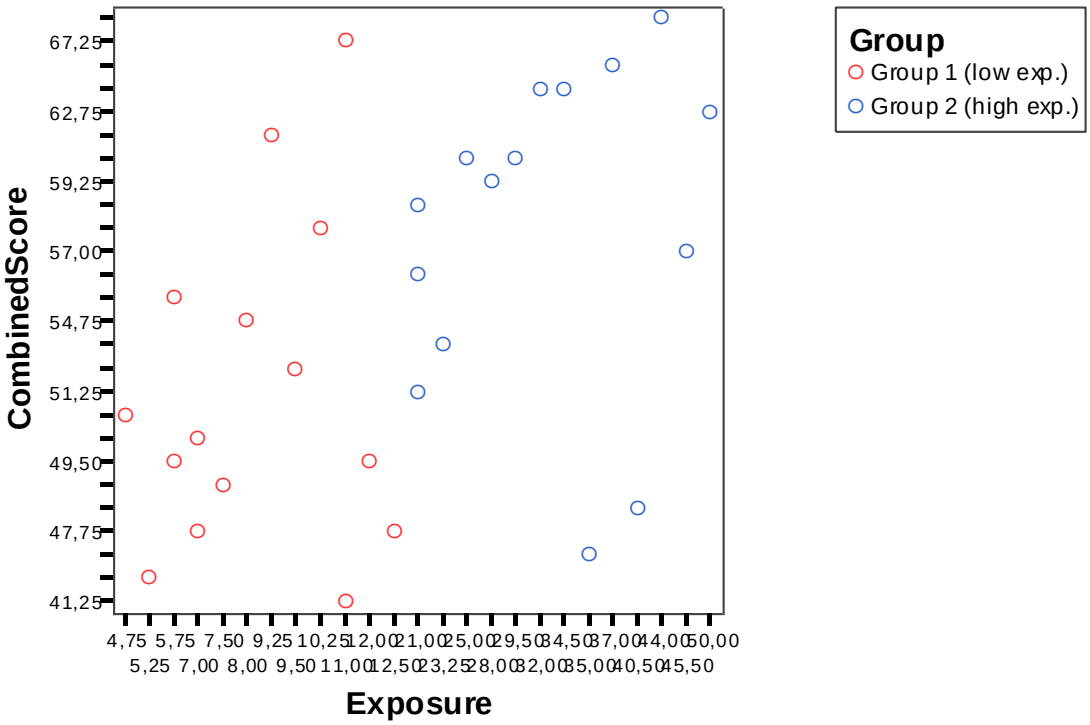


Figure 10: Scatterplot illustrating the correlation between amount of exposure and combined results

		Grade	CombinedScore
Grade	Pearson Correlation	1	,189
	Sig. (2-tailed)		,317
	N	30	30
CombinedScore	Pearson Correlation	,189	1
	Sig. (2-tailed)	,317	
	N	30	30

Table 22: Correlation between school grade and combined results

		Age	CombinedScore
Age	Pearson Correlation	1	,077
	Sig. (2-tailed)		,686
	N	30	30
CombinedScore	Pearson Correlation	,077	1
	Sig. (2-tailed)	,686	
	N	30	30

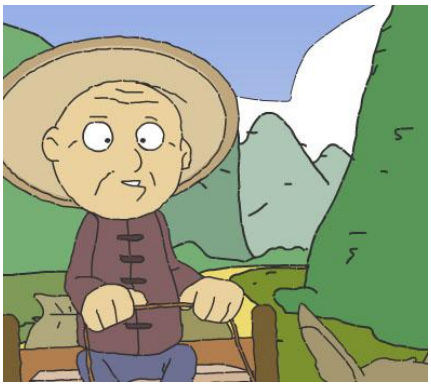
Table 23: Correlation between age and combined results

		Gender	CombinedScore
Gender	Pearson Correlation	1	,071
	Sig. (2-tailed)		,711
	N	30	30
CombinedScore	Pearson Correlation	,071	1
	Sig. (2-tailed)	,711	
	N	30	30

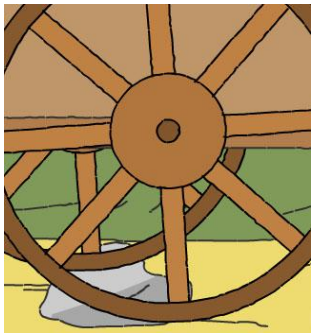
Table 24: Correlation between gender and combined results

C Pronunciation Task: Story

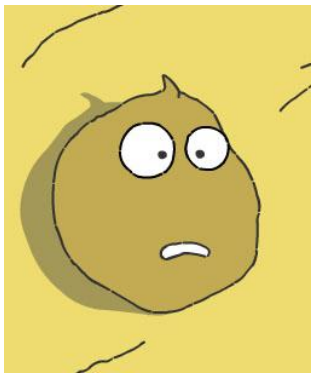
The Lucky Seed [6]



1 A long time ago, a farmer named Luke took a bag of seeds to sell at the market. He had to
2 leave quickly, or else he would miss the ferry. On his way to the market, he took a good
3 look at all the neat houses he passed.

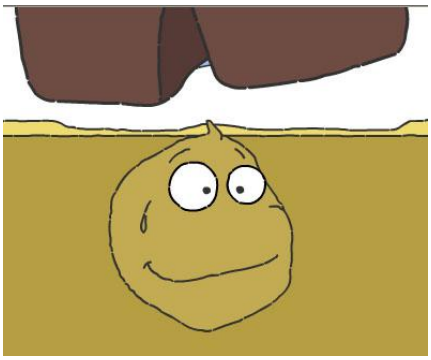


4 Suddenly, the wheel of his cart hit a big stone.

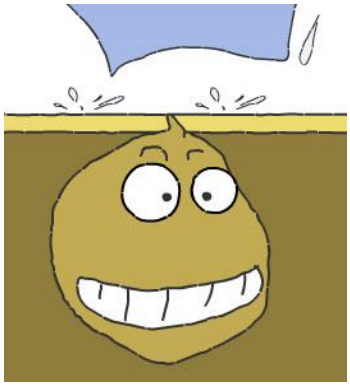


5 One of the seeds fell out of the bag and onto the dry ground. "I'm scared," said the seed. "I
6 think that I need to be safe under the soil."

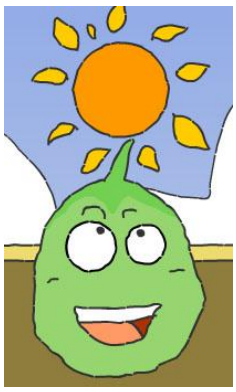
[6] Adaptation of: "The Lucky Seed" (http://www.britishcouncil.org/kids-stories-lucky-seed.htm)



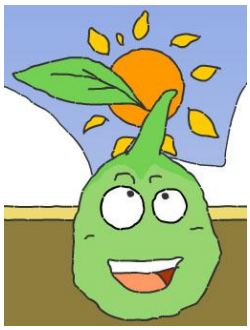
7 Then a buffalo walked by and the seed said: “Please, push me into the ground with your
8 foot, I beg you!” The good buffalo set his foot on the seed and pushed it into the ground.



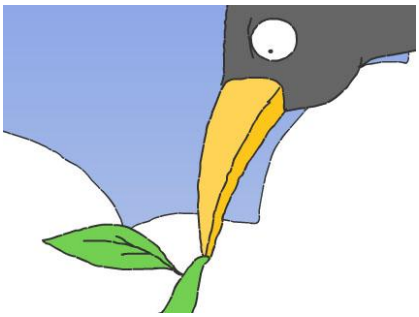
9 “I’m thirsty,” said the seed. “I need some water to help me grow.” Then, it started to rain.



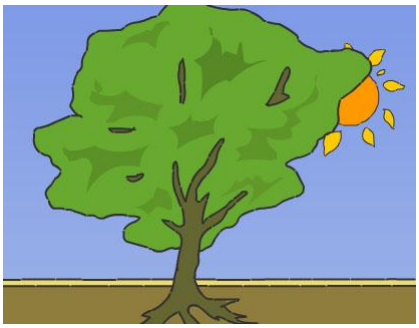
10 The next morning, the seed had a thin green shoot. All day it sat in the sun and grew taller
11 and taller.



12 The next day, it had a first leaf. This helped it to catch rays of sunlight and grow.



13 That evening a noisy and hungry bird tried to eat it. But the seed had roots to help it stay in
14 the ground.



15 Many years of sunshine and rain passed. The seed became a plant and the plant became a
16 tree. Today, if you visit the countryside and take a seat on a log, you can see the tree. It is a
17 very big and strong tree now and makes seeds of its own.

D Pronunciation Task: Individual data per test item

i) VOT

Group I	"time" VOT (ms)	"push" VOT (ms)
1	100	20
2	58	30
3	67	87
4	47	19
5	57	27
6	64	36
7	32	25
8	60	17
9	71	20
10	91	25
11	25	12
12	92	53
13	43	25
14	62	18
15	76	25

Group II	"time" VOT (ms)	"push" VOT (ms)
16	100	61
17	80	25
18	41	18
19	92	104
20	69	77
21	98	23
22	96	17
23	58	48
24	35	45
25	74	27
26	88	11
27	69	68
28	62	15
29	76	39
30	38	27

Table 25: VOT data

Pronouncing initial plosives /p/, /t/, or /k/ in stressed syllables with a short-lag VOT in L2 English is caused by negative transfer from Dutch. A native-like English pronunciation would have a long-lag VOT. Short-lag VOTs of 0 to 25 ms are therefore incorrect and marked red in Table 25 above. Long-lag VOTs of more than 60 ms are correct and marked green. Any VOTs of between 25 and 60 ms are marked orange and indicate that the participant has moved away from the L1 pronunciation, but is not quite native-like yet in their L2 pronunciation.

ii) Final devoicing

Group I	"had" FD yes/no	"log" FD yes/no
1	Yes	Yes
2	Yes	Yes
3	No	No
4	Yes	No
5	Yes	Yes
6	No	No
7	Yes	No
8	No	No
9	No	No
10	Yes	No
11	Yes	Yes
12	No	No
13	Yes	Yes
14	Yes	No
15	No	No

Group II	"had" FD yes/no	"log" FD yes/no
16	No	Yes
17	No	No
18	No	No
19	No	Yes
20	Yes	No
21	No	No
22	No	Yes
23	No	No
24	Yes	No
25	Yes	No
26	No	Yes
27	Yes	No
28	No	No
29	Yes	No
30	No	No

Table 26: Final devoicing data

Dutch has final devoicing, English does not. Any instances of final devoicing (FD) for the test items in Table 26 are therefore considered instances of negative transfer and are marked red, as opposed to the correctly pronounced test items which are marked green.

iii) /v/~/f/

Group I	"very" /v/ yes/no	"leave" /v/ yes/no	Group II	"very" /v/ yes/no	"leave" /v/ yes/no
1	No	Yes	16	No	Yes
2	No	No	17	No	No
3	Yes	No	18	Yes	Yes
4	No	Yes	19	Yes	Yes
5	No	Yes	20	No	Yes
6	No	Yes	21	No	Yes
7	No	No	22	Yes	No
8	Yes	No	23	Yes	Yes
9	Yes	No	24	Yes	Yes
10	Yes	No	25	No	No
11	Yes	Yes	26	No	Yes
12	Yes	No	27	No	No
13	No	Yes	28	No	Yes
14	No	Yes	29	Yes	Yes
15	No	Yes	30	Yes	Yes

Table 27: /v/~/f/ data

Often, Dutch learners of English confuse the /v/ and /f/ in their L2 pronunciation. In case a participant erroneously pronounced what should have been [v] as [f], this is marked red in Table 27. Correctly pronounced test items are marked green.

iv) /δ/ and /θ/

Group I	"then" /δ/ yes/no	"thin" /θ/ yes/no
1	Yes	No
2	Yes	No
3	Yes	No
4	No	No
5	Yes	No
6	Yes	Yes
7	Yes	Yes
8	No	No
9	No	No
10	Yes	No
11	No	No
12	Yes	Yes
13	No	No
14	Yes	No
15	Yes	Yes

Group II	"then" /δ/ yes/no	"thin" /θ/ yes/no
16	No	Yes
17	Yes	No
18	No	No
19	No	Yes
20	Yes	Yes
21	Yes	Yes
22	Yes	Yes
23	Yes	Yes
24	Yes	No
25	Yes	Yes
26	Yes	Yes
27	No	No
28	No	No
29	No	Yes
30	Yes	Yes

Table 28: /δ/ and /θ/ data

Since the English phonemes /δ/ and /θ/ do not exist in Dutch, Dutch learners of English often replace them with other, more familiar, phonemes. /δ/ is often replaced by /d/ and /θ/ by /t/ or /s/. For /θ/ in the current study, however, only replacement by /t/ was encountered. If the participants correctly pronounced the phoneme /δ/ or /θ/, this is marked green in Table 28 above. If the participants replaced /δ/ or /θ/ with another phoneme, this is considered to be an 'error' and is therefore marked red in the table.

v) /z/~[s]

Group I	"houses" /z/ yes/no	"noisy" /z/ yes/no
1	No	No
2	No	No
3	No	No
4	No	No
5	No	No
6	Yes	No
7	No	No
8	No	Yes
9	No	Yes
10	Yes	No
11	No	Yes
12	No	No
13	Yes	No
14	No	No
15	No	No

Group II	"houses" /z/ yes/no	"noisy" /z/ yes/no
16	No	No
17	Yes	No
18	Yes	No
19	No	No
20	Yes	Yes
21	No	Yes
22	Yes	No
23	Yes	No
24	No	No
25	Yes	No
26	No	No
27	No	No
28	No	No
29	Yes	No
30	No	Yes

Table 29: /z/~/s/ data

Sometimes in English words, the grapheme "s" should be pronounced as [z]. Dutch learners of English often do not know the phonological rule that dictates this pronunciation of [z] and incorrectly pronounce an [s], because that is what the spelling suggests. In case this occurs in word final position, it could be blamed on applying the Dutch rule of final devoicing in their L2 English. If it happens in non-final position, however, it becomes apparent that they are unaware of the aforementioned phonological rule. Table 29 shows which test items were correctly pronounced with [z] (marked green) and which were incorrectly pronounced with [s] (marked red).

vi) Liprounding for /w/

Group I	"wheel" rounded yes/no	"water" rounded yes/no
1	Yes	Yes
2	Yes	Yes
3	Yes	Yes
4	Yes	Yes
5	Yes	Yes
6	Yes	Yes
7	Yes	Yes
8	Yes	Yes
9	Yes	Yes
10	No	No
11	Yes	Yes
12	No	Yes
13	Yes	Yes
14	Yes	Yes
15	Yes	Yes

Group II	"wheel" rounded yes/no	"water" rounded yes/no
16	Yes	Yes
17	Yes	Yes
18	Yes	Yes
19	Yes	Yes
20	Yes	Yes
21	Yes	Yes
22	Yes	Yes
23	Yes	Yes
24	Yes	Yes
25	Yes	Yes
26	Yes	Yes
27	Yes	Yes
28	Yes	Yes
29	Yes	Yes
30	Yes	Yes

Table 30: Liprounding for /w/ data

Dutch learners of English often mispronounce /w/ due to a lack of liprounding. The sound they then produce sounds like /v/ to native English listeners and could therefore cause confusion between, for example, minimal pairs like "west~vest". The test items that were correctly pronounced by the participants, i.e. with liprounding, are marked green in Table 30 and those that lacked liprounding are marked red.

vii) /ɹ/

Group I	"dry" /ɹ/ yes/no	"rain" /ɹ/ yes/no	Group II	"dry" /ɹ/ yes/no	"rain" /ɹ/ yes/no
1	Yes	Yes	16	Yes	Yes
2	Yes	Yes	17	Yes	Yes
3	Yes	Yes	18	Yes	Yes
4	Yes	Yes	19	Yes	Yes
5	Yes	Yes	20	Yes	Yes
6	Yes	Yes	21	Yes	Yes
7	Yes	Yes	22	Yes	Yes
8	Yes	Yes	23	Yes	Yes
9	Yes	Yes	24	Yes	Yes
10	Yes	Yes	25	Yes	Yes
11	Yes	Yes	26	Yes	Yes
12	Yes	Yes	27	Yes	Yes
13	No	No	28	Yes	Yes
14	Yes	Yes	29	Yes	Yes
15	Yes	Yes	30	Yes	Yes

Table 31: /ɹ/ data

Dutch learners of English often replace the English alveolar approximant /ɹ/ with allophones that are common in their L1, but not in English, namely an alveolar trill /r/, an alveolar tap /ɾ/, or a voiced uvular fricative /ʁ/. The test items that were correctly pronounced with the alveolar approximant /ɹ/ are marked green in Table 31. The only participant who had an incorrect pronunciation, marked red in the table, replaced the alveolar approximant /ɹ/ with a voiced uvular fricative /ʁ/.

viii) Vowel length

Group I	"seed" VL (ms)	"seat" VL (ms) and ratio	"need" VL (ms)	"neat" VL (ms) and ratio
1	117	145 ; –	106	106 ; –
2	161	136 ; 1.18	138	136 ; 1.01
3	237	187 ; 1.27	217	154 ; 1.41
4	122	203 ; –	160	124 ; 1.29
5	149	206 ; –	124	198 ; –
6	173	123 ; 1.41	171	135 ; 1.27
7	124	128 ; –	99	87 ; 1.14
8	159	170 ; –	141	146 ; –
9	124	137 ; –	94	98 ; –
10	125	117 ; 1.07	90	125 ; –
11	125	134 ; –	138	130 ; 1.06
12	127	131 ; –	127	131 ; –
13	126	118 ; 1.07	142	171 ; –
14	158	158 ; –	152	184 ; –
15	95	135 ; –	135	155 ; –
Mean	141.5	149.1	135.6	138.7
SD	33.7	30.2	32.8	30.6

Group II	"seed" VL (ms)	"seat" VL (ms) and ratio	"need" VL (ms)	"neat" VL (ms) and ratio
16	134	142 ; –	133	141 ; –
17	131	114 ; 1.15	107	125 ; –
18	152	140 ; 1.09	140	146 ; –
19	122	156 ; –	190	129 ; 1.47
20	140	97 ; 1.44	140	152 ; –
21	117	135 ; –	74	110 ; –
22	126	94 ; 1.34	124	108 ; 1.48
23	139	103 ; 1.35	134	96 ; 1.40
24	117	124 ; –	99	93 ; 1.06
25	136	132 ; 1.03	154	123 ; 1.25
26	126	113 ; 1.12	118	138 ; –
27	179	152 ; 1.18	157	170 ; –
28	127	142 ; –	149	166 ; –
29	131	142 ; –	188	109 ; 1.72
30	143	162 ; –	165	159 ; 1.04
Mean	134.7	129.9	138.1	131.0
SD	15.6	21.4	31.5	24.7

Table 32: Vowel length data

Vowels preceding a voiced consonant should be longer in English than those preceding their voiceless cognate, the so-called "Voicing Effect". Vowel length (VL) is not contrastive in Dutch, but it is in English. Pronouncing too short a vowel in for example "seed" could cause a native English listener to perceive it as "seat". The participants' vowel length before a voiced consonant should be at least 1.07 times longer than before its voiceless counterpart. If this was the case, it is marked green in Table 32 above. If not, it is marked red. In case the vowel before the voiced consonant was longer, but with a ratio of less than 1.07:1, it is marked orange in the table.

ix) */æ/~/ɛ/*

Group I	"bag" F1 (Hz)	"beg" F1 (Hz)	"bag" F2 (Hz)	"beg" F2 (Hz)	"sat" F1 (Hz)	"set" F1 (Hz)	"sat" F2 (Hz)	"set" F2 (Hz)	F1	F2
1	651	555	1867	2095	657	559	1794	1843	Both	One
2	696	692	1862	2040	685	684	2089	1921	Neither	One
3	719	722	1958	2020	659	656	1896	1778	Neither	Neither
4	639	589	1951	2085	605	677	1987	1841	One	One
5	599	598	1989	1928	617	572	1769	1700	One	Neither
6	803	726	2054	2213	712	691	1900	1998	Both	One
7	548	817	1591	1786	553	542	1563	1581	One	One
8	790	690	1888	2000	662	676	2014	1868	One	Neither
9	802	667	1689	1911	737	571	1369	1889	Both	Both
10	589	626	1988	2149	593	606	1867	2078	Neither	Both
11	632	560	1862	1933	498	567	1837	1731	One	Neither
12	633	617	1934	1908	517	593	1802	1975	One	One
13	697	642	1982	2170	658	578	2045	1957	Both	One
14	588	557	1861	1950	620	522	1872	1807	Both	Neither
15	714	628	1935	2000	697	568	1821	1802	Both	Neither
Mean	673	646	1894	2013	631	604	1842	1851		
SD	81.3	74.0	119.3	115.5	69.4	56.9	183.6	127.1		

Group II	"bag" F1 (Hz)	"beg" F1 (Hz)	"bag" F2 (Hz)	"beg" F2 (Hz)	"sat" F1 (Hz)	"set" F1 (Hz)	"sat" F2 (Hz)	"set" F2 (Hz)	F1	F2
16	647	665	2043	2108	569	661	2008	1990	Neither	Neither
17	758	574	2118	2173	673	597	2063	2005	Both	Neither
18	722	704	1992	2107	712	702	2055	2109	Both	Neither
19	746	728	1910	1982	701	678	1781	1810	Both	Neither
20	699	625	1933	1981	654	637	1922	1923	Both	Neither
21	681	664	1796	1818	641	661	1842	1785	One	Neither
22	596	637	1958	1930	560	622	1956	1843	Neither	Neither
23	687	635	1735	1714	618	543	1714	1676	Both	Neither
24	589	515	1614	1725	540	566	1667	1748	One	Neither
25	655	630	1812	1857	603	590	1722	1666	Both	Neither
26	567	563	1692	1823	576	548	1721	1717	One	One
27	694	769	1960	1996	681	723	1965	1890	Neither	Neither
28	759	801	1770	1834	757	737	1693	1711	One	Neither
29	700	724	1774	1895	627	630	1923	1828	Neither	One
30	599	514	1821	1839	543	523	1722	1680	Both	Neither
Mean	673	650	1862	1919	630	628	1850	1825		
SD	62.8	85.9	139.6	138.0	66.1	66.6	141.0	135.1		

Table 33: /æ/~/ɛ/ F1 and F2 data

Table 33 shows all the measured F1 and F2 frequencies for the test and control items that were included in the pronunciation task to check whether or not the participants distinguished between /æ/ and /ɛ/. The F1s of the /æ/ test items "bag" and "sat" had to fall within the range of 558-1010 Hz and be at least 8 Hz higher than the F1s of the corresponding control items' /ɛ/ ("beg" and "set") in order to be considered correct. If they fell within the determined range, but were less than 8 Hz higher, or did not fall within range at all, the F1s of /æ/ would be considered non-nativelike. If "both" F1s were correct, this is marked green in Table 33. If only "one" of the test items' F1s for /æ/ was correct, this is marked orange and if "neither" of the test items were pronounced correctly, this is marked red in the table.

The F2s of the test items had to lie between 1333-2501 Hz and be at least 120 Hz lower than the F2s of the accompanying control items. Again, if the F2s were correct for "both" test items, this is marked green. If "one" of the F2s was correct, but the other was out of range or less than 120 Hz lower, this is marked orange and if "neither" were correct, this is marked red.

x) ***/ʊ/~/u:/***

Group I	"look"		"Luke"	"foot"		"shoot"		
	F1 (Hz)	F2 (Hz)	F1 (Hz)	F1 (Hz)	F2 (Hz)	F1 (Hz)	"look"	"foot"
1	515	1643	415	430	1318	433	Correct	F1 /ʊ/ lower
2	450	1137	410	448	1026	416	Dif. < 60 Hz	Dif. < 60 Hz
3	623	1406	471	476	1133	412	Out of range	Correct
4	486	1722	401	652	1468	382	Correct	Out of range
5	468	1382	408	404	1173	442	Correct	F1 /ʊ/ lower
6	450	1340	446	547	1049	387	Dif. < 60 Hz	Correct
7	1092	2243	1250	1007	2239	651	Out of range	Out of range
8	504	1188	508	468	1228	434	F1 /ʊ/ lower	Dif. < 60 Hz
9	460	1371	406	462	1377	387	Dif. < 60 Hz	Correct
10	404	1277	408	475	1651	430	F1 /ʊ/ lower	Dif. < 60 Hz
11	573	1606	378	355	1120	640	Out of range	F1 /ʊ/ lower
12	447	1356	408	390	1405	365	Dif. < 60 Hz	Dif. < 60 Hz
13	461	1250	370	479	1281	407	Correct	Correct
14	408	1299	356	388	1130	369	Dif. < 60 Hz	Dif. < 60 Hz
15	448	1319	431	450	1315	426	Dif. < 60 Hz	Dif. < 60 Hz
Mean	519	1436	471	495	1327.5	438.7		
SD	168.6	276.7	218.8	158.4	303.3	87.4		

Group II	"look"		"Luke"	"foot"		"shoot"		
	F1 (Hz)	F2 (Hz)	F1 (Hz)	F1 (Hz)	F2 (Hz)	F1 (Hz)	"look"	"foot"
16	443	1086	411	465	976	398	Dif. < 60 Hz	Correct
17	425	1458	448	434	1546	364	F1 /ʊ/ lower	Correct
18	460	1662	490	481	1231	684	F1 /ʊ/ lower	F1 /ʊ/ lower
19	660	1665	458	615	1520	387	Out of range	Out of range
20	470	1468	432	415	1112	397	Dif. < 60 Hz	Dif. < 60 Hz
21	455	1236	406	408	1138	380	Dif. < 60 Hz	Dif. < 60 Hz
22	424	1754	416	436	1243	397	Dif. < 60 Hz	Dif. < 60 Hz
23	1017	2225	845	738	2105	754	Out of range	Out of range
24	366	1148	351	564	1278	369	Dif. < 60 Hz	Correct
25	829	2000	1014	926	2057	411	Out of range	Out of range
26	423	1251	546	830	2381	556	F1 /ʊ/ lower	Out of range
27	701	1832	485	451	1293	575	Out of range	F1 /ʊ/ lower
28	822	2069	455	792	2098	415	Out of range	Out of range
29	629	1173	429	500	1257	415	Out of range	Correct
30	506	1338	530	366	1131	667	F1 /ʊ/ lower	F1 /ʊ/ lower
Mean	575	1558	514	561	1491	478		
SD	192.7	362.6	178.4	177.1	446.7	132.2		

Table 34: /ʊ/~/u:/ F1 and F2 data

Due to the fact that neither /ʊ/ nor /u:/ occur in Dutch, but are very similar to the Dutch MOE vowel /u/, many Dutch learners of English do not distinguish between /ʊ/ and /u:/. In order for their pronunciation of the test items to be considered native-like, the participants had to pronounce the /ʊ/ with an F1 of between 258-568 Hz and an F2 of between 880-1747 Hz. Furthermore, the F1 of /ʊ/ had to be at least 60 Hz higher than that of the /u:/ in the corresponding control item. If these conditions were met, the pronunciation of the test item in question would be deemed correct and marked green in Table 34. If the F1 and F2 of /ʊ/ fell within range and its F1 was between 1 and 60 Hz higher than the F1 of the /u:/ in the control item, this is marked orange in the table. The red markings indicate that either the F1 and F2 for /ʊ/ did not fall within the determined range, or that the F1 of /ʊ/ was equal to or lower than the F1 of the /u:/ in the control item.