

Cross Linguistic Influence in Bilingual and Monolingual Second Language Acquisition

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Abstract

The present study combines the two fields of Cross Linguistic Influence (CLI) and simultaneous and early bilingual foreign language learning to examine the spoken data of Dutch monolingual speakers and Dutch/German bilingual speakers of English in terms of Voice Onset Time (VOT) of plosives. Simultaneous and early monolinguals have been shown to have advantages over monolinguals when learning a foreign language due to differences in their linguistic background (Cenoz, 2003; Cenoz, 2011). It has also been argued that CLI is more likely to occur between languages that are typologically close (Jarvis & Odlin, 2000; Odlin, 2013).

All three languages in the present study are typologically close. However, Dutch differs from German and English in terms of the voicing contrast. Therefore, it is hypothesised that the bilingual speakers are likely to produce VOTs within the English voicing contrast range thanks to similarities between German and English in the realisation of the voicing contrast resulting in positive CLI. The monolingual speakers are hypothesised to only partially achieve the English voicing contrast (negative CLI), because Dutch has a different realisation of the voicing contrast compared to English. Empirical data support these hypotheses, as the bilinguals' VOTs were higher than the monolinguals' in all cases and, thus, closer to the English contrast. However, in certain cases the monolinguals also produced VOTs within the English range.

Table of Contents

Abstract	1
1. Introduction	3
2. Theoretical Background	4
2.1 The Voicing Contrast in Dutch, German, and English.....	4
2.2 Cross Linguistic Influence.....	6
2.3 Research Questions.....	8
3. Methodology	9
3.1 Participants	9
3.2 Materials	10
3.3 Procedure	11
4. Results	12
4.1 Voiceless Plosives	12
4.2 Voiced Plosives	14
5. Discussion	16
5.1 The Voicing Contrast in L2 _{English} by Dutch/German bilinguals	16
5.2 VOT Values of Dutch/German Bilinguals and Dutch Monolinguals in L2 _{English}	16
5.3 CLI on L2 _{English} VOT	18
6. Conclusion and Suggestions for Further Research	19
References	21
Appendix A: Slightly Adapted Extract from Oscar Wilde’s “The Devoted Friend” (1993) ...	23

1. Introduction

Second language acquisition (SLA) studies the processes and stages second language learners go through, as well as differences in phonology, syntax, semantics, and pragmatics between the first language (L1) and second language (L2) of learners. Ways in which (structures and/or rules from) the L1 might influence the L2 are also of interest in this field of research (Simon, 2009; Wrembel, 2015). For the purpose of this study, the term ‘bilingual’ refers to simultaneous or early bilingualism, and L1/L2/L3 refers to the chronological order of acquisition of a speaker’s language(s). In other words, L1 or first language means a speaker’s native language or languages (in the case of simultaneous and early bilinguals), L2 and L3 refer to foreign languages with the beginning of acquisition in that order.

The influence of certain aspects of a language already known by a learner (i.e. his/her first language) on a language being acquired (an L2/L3/L_n) is called Cross Linguistic Influence, or CLI (Kellerman, 1984, cited in Wunder, 2011; Odlin, 2013). Research on CLI in second and third language acquisition can bring useful insights, both theoretically and for (classroom) teaching methods. It has been shown that foreign language learners can transfer certain elements (consciously or not) from their L1 (or L2) into a foreign language being learnt (an L2 or L3), such as the use of certain prepositions or phonological features (Jarvis & Odlin, 2000). L3 learners have already learnt a second language after their native language(s), and therefore have experience in learning a foreign language. They have been through the process of learning a foreign language once already and have already acquired strategies for learning and processing it. These might prove useful when learning an additional language (Cenoz, 2003).

More recently, the interest in third and additional language acquisition has increased (Hammarberg, 2001; Simon & Leuschner, 2010; Wunder, 2011; Wrembel, 2015). Research on foreign language acquisition of (simultaneous or early) bilinguals has also seen an increase in interest (Cenoz, 2003; 2011; Gut, 2010). Cenoz (2011) points out that simultaneous and

early bilinguals have been shown to have certain advantages over monolinguals when learning a foreign language as well. However, this does not stem from their experience of foreign language learning, as simultaneous or early bilinguals have acquired two languages at the same time as a mother language in a naturalistic setting, not in the context of foreign language learning. The advantage they have over monolinguals might be linked to having “a wider linguistic repertoire”, i.e. bilinguals have pre-existing vocabulary, syntactic, and expressive skills in two languages instead of one that can be used to relate structures, vocabulary, and syntax from the L2 to (Cenoz, 2003). Furthermore, bilingual L2 learners possess two phonological systems, which may be beneficial in the acquisition of an additional language.

In the present study, two groups of foreign language learners will be compared on the phonetic contrast of voicing in English. This contrast is realised differently in English, Dutch, and in German, Dutch being a voicing language, and English and German aspirating languages (see, among others, Lisker & Abramson, 1964; Simon, 2009; Simon & Leuschner, 2010). The first group of participants consists of Dutch/German simultaneous bilinguals, whereas the second group is made up of Dutch monolinguals. Both groups have received similar amounts of education in English. The aim is to determine possible differences between the Dutch/German bilinguals and the Dutch monolinguals when compared to English native speaker voicing norms, and, if so, which of the two native languages of the bilingual speakers has had a greater influence on the realisation of the voicing contrast in L2_{English}.

2. Theoretical Background

2.1 The Voicing Contrast in Dutch, German, and English

Dutch, German, and English all have a contrast between voiceless (fortis) plosives /p, t, k/ and voiced (lenis) plosives /b, d/ in Dutch, German, and English and /g/ in German and English (apart from certain pronunciations of a number of loanwords, Dutch has no /g/). The phonetic realisation of this contrast, however, is not the same. Lisker and Abramson (1964) performed

measurements of Voice Onset Time (VOT) in recordings of eleven languages. From these measurements, they concluded that there are three distinct categories of plosives: pre-voiced voiced plosives, voiceless unaspirated plosives, and voiceless aspirated plosives. A language distinguishing between the first and second category (pre-voiced plosives and voiceless unaspirated plosives) is called a voicing language. If the contrast is determined by the voiceless unaspirated plosives and the voiceless aspirated plosives, it is termed aspirating language. Dutch falls into the category of voicing languages, and German and English fall into the aspirating languages.

Voice Onset Time is the amount of time (in milliseconds) that expires between the release of the plosive and the start of vibration in the vocal folds (Lisker & Abramson, 1964). In Dutch, voiced plosives (/b, d/) are realised with pre-voicing, i.e. the vocal folds vibrate before the release of the plosive, which results in a negative VOT. Voiceless plosives (/p, t, k/) are unaspirated and have a relatively short VOT, termed short-lag VOT. English and German both fall into the aspirating languages and, thus, distinguish between voiced (/b, d, g/) and voiceless plosives (/p, t, k/) by means of aspiration. Voiced plosives are realised without aspiration and with short-lag VOT. Voiceless plosives in initial stressed syllable are realised with aspiration. Consequently, the time passing between the release of the plosive and beginning of the vocal fold vibration is longer than in the case of unaspirated plosives. Aspirated plosives in German and English have long-lag VOT (Lisker & Abramson, 1964; Simon & Leuschner, 2010).

Although German and English are both aspirating languages that realise the contrast between plosives similarly, average VOT ranges are not the same for both languages. Lisker and Abramson (1964) found VOTs for aspirated plosives in English ranging from 58 ms to 80 ms and unaspirated plosives in the 0-25 ms range. Wunder (2011) found aspirated plosives in German to range from 30 ms to 60 ms, whereas Simon and Leuschner (2010) reported values between 60 ms and 80 ms for these plosives in German based on Haag (1979), Ackermann

and Hertrich (1997), and Jessen (1998). Unaspirated plosives in German range from 10 ms to 40 ms according to Simon and Leuschner (2010), or 0-25 ms according to Ackermann and Hertrich (1997), and Jessen (1998) (cited in Simon & Leuschner, 2010).

Lisker and Abramson (1964) found VOT in Dutch to range from -85 to -80 ms for plosives with pre-voicing. Results from Van Alphen and Smits (2004) are similar to this, with averages of -82.8 ms for /b/ and -71.23 ms for /d/. However, Van Alphen and Smits also found that pre-voicing is not necessarily present in Dutch voiced plosives, and that it varies from speaker to speaker, some speakers producing pre-voicing in all cases and others only a little more than a third of the time (38%). For voiceless plosives, VOT values between 10 ms and 25 ms were found by Lisker and Abramson (1964) and Simon (2009) where Van Alphen and Smits found values of 18.91 ms and 31.39 ms for /p/ and /t/ respectively (2004).

In sum, English aspirated plosives have been found to range from 58 ms to 80 ms and unaspirated ones from 0 ms to 25 ms. German has aspirated plosives in the 30-80 ms range and unaspirated plosives between 0 ms and 40 ms. Dutch has VOTs for voiceless plosives between 10 ms and 32 ms and shows pre-voicing of 70 ms to 85 ms for voiced plosives. However, it has been found that pre-voicing is not a mandatory feature for voiced plosives in Dutch.

2.2 Cross Linguistic Influence

Cross linguistic influence is a term used to refer to transfer or interference from one language to another in second or foreign language acquisition. This influence can be from the L1 on the L2 or L3, but also from the L2 on the L3. Furthermore, CLI can be used to indicate both positive transfer (a feature present in both the L1 and the L n is carried over correctly by the learner) as well as negative transfer (a feature present in the L1 but absent in the L n is used by the learner in the L n) from the L1 (or L n) on a foreign language, for example in the case of word order or pronoun use. Some also argue that CLI can take place in either direction (i.e. L1→L2, or L2→L1) (Pavlenko & Jarvis, 2002; Odlin, 2013). It is argued that the typological

proximity of the L1 and the language being learnt may affect the nature and degree of (potential) cross linguistic influence (positive or negative, and large or little influence) (Flege, 1987; Cenoz, 2003). Dutch, English, and German are all part of the same language family (Germanic languages), whereas French or Spanish are Romance languages. Positive influence between languages within the same family is said to be greater than positive influence between languages from two different language families.

Research on CLI in second and third language acquisition appears to be mixed; Gut (2010) was unable to find clear evidence for CLI from the L1 on the L2 or L3, nor from the L2 on the L3 with speakers of varying L1s and German and English as L2 and L3 considering vowel reduction and speech rhythm. Wunder (2011) did not find clear evidence for CLI from the L1 or L2 on the L3 in terms of VOT when studying German L1 speakers with English as L2 in the process of learning Spanish. Wrembel (2015) concluded that her native speakers of German who had English as L2 (foreign language acquired after the L1 in a classroom setting) and French as L3 did not successfully acquire the French contrast between voiced and voiceless plosives, rather settled on “compromise values” as they produced results that were not in the English nor the German VOT value ranges, but not in the French target VOT range either. However, the participants in this study had German as L1 and English as an L2 which are both aspirating languages, whereas the L3 (French) is a voicing language. Thus, to determine if possible transfer stems from the L1 or from the L2 is an issue because of the similarity between the two.

Hammarberg (2001) researched foreign accent of one native speaker of English with high proficiency in German who was learning Swedish. Following this speaker from her very beginnings in acquiring Swedish, her accent was at first German-coloured. She also showed influence from German on her Swedish vocabulary. Both influences from her German L2 disappeared; lexical influences from German disappeared altogether, and her accent lost its German colouring and became English-coloured. Here, the influence from an L2 in the initial

stages of third language acquisition are quite clear, making place for influences from the L1 once the speaker has gained in Swedish proficiency. Hammarberg ascribes this initial L2 influence on the L3 to the desire of the speaker to not sound English, and the later L1 influence in the phonetic domain to previously automated neuro-motor routines when she acquired her L1.

The overall conclusion on CLI seems that positive influence takes place mostly when the two languages concerned are typologically close (Odlin, 2013; Wrembel, 2015). Conversely, areas where languages differ are most likely where negative transfer will occur (Odlin, 2013). Previous studies, however, have not been performed with the L1 and L2 (or both L1s in the case of simultaneous bilinguals) differing in terms of VOT whilst at the same time having similar typological distance from the L3. Such a study would provide useful insights into the issue of CLI onto the L2 from the L1_A or L1_B in terms of VOT. That is where the present research comes in, studying participants with Dutch and German as L1s, and English as the L2. All three languages fall into the Germanic family, however, the two L1s differ from each other in terms of realisation of the voicing contrast.

2.3 Research Questions

The present study addresses three main research questions. First, how do L1 Dutch/German simultaneous bilinguals produce voiced and voiceless plosives in L2 English? Second, are the L2 English productions of word-initial plosives by Dutch/German bilinguals closer to Standard Dutch, High German, or Standard English VOT reference values? I.e. are the produced VOT values in English close to English reference values or is there a visible influence from either one of the participants' L1s on their L2_{English} VOT values?

Previous research on the voicing contrast by Dutch monolinguals in L2 English by Simon (2009) has shown that the English voicing contrast was only partially acquired. Voiceless plosives in word-initial position were realised with long-lag VOT and aspiration, with values close to native speaker English. Short-lag stops in English (/b, d, g/) were

hypothesised to be successfully produced by these Dutch advanced learners of English, because Dutch also has a group of short-lag stops (/p, t, k/). The short-lag stops in L2_{English}, however, were not produced in the expected range. Rather, in 92.5% of the tokens, participants produced pre-voiced stops for /b, d, g/, following the Dutch voicing contrast.

The third research question is: how do the VOT values of these Dutch/German bilingual learners of English compare to those of Dutch monolingual learners of L2 English? And fourthly, can possible differences between the two groups be explained from CLI due to differences in L1s between the groups? Because the Dutch and English voicing contrasts are realised differently, Dutch monolinguals might be expected to fail to achieve the English contrast due to negative transfer from the L1. German and English, however, have similar VOT values, which could prove helpful in the realisation of word-initial plosives in English by the group of Dutch/German bilinguals being studied here.

3. Methodology

3.1 Participants

Two groups of participants were used for this study. The first group consisted of four Dutch/German bilinguals (the bilingual group), aged 18 to 25 (median: 22), living in the Netherlands since birth. One participant in this group was female and the other three were male. They all started learning both Dutch and German simultaneously from birth (75%) or German slightly after Dutch at age 4 and 2 respectively (25%). At the time of the interviews, all speakers indicated using and/or speaking Dutch most of the time. One speaker indicated using Dutch 75% of the time and German 25%. Two speakers indicated a 90%/10% ratio, and one speaker a 95%/5% ratio. The bilingual participants had all had five to eight years of English classes (median: 8), starting at the end of primary school or the beginning of secondary education. At the time of participating, all participants had passed secondary education at the VWO level and were enrolled in different universities and degrees in the Netherlands or had just finished their master's degree. Students reported speaking in English

zero to fifteen minutes a day, and hearing English (including tv and radio) 45 minutes to four hours per day on average. None of the students was or had been studying English language and/or pronunciation past secondary school level, nor spent more than two weeks in an English-speaking country.

The second group consisted of four monolingual speakers of Dutch (the monolingual group), aged 19 and 20 (median: 20). Half were female, and half were male. All had had seven to ten years of English lessons (median: 8), starting at the end of primary school. All speakers of the monolingual group passed secondary education at VWO level and were currently enrolled in different degrees at university or a university of applied science in the Netherlands. Speaking in English was reported to be between thirty minutes and one hour per day and listening to English (including tv and radio) was reported to be thirty minutes to five hours per day. As in the bilingual group, none of the students was or had been studying English language and/or pronunciation past secondary school level, nor had spent time abroad in an English-speaking country. Time spent in a German speaking country was minimal with two weeks maximum for three of the students, and no more than one week for the fourth student. Speaking or hearing German was limited to the regular two years required in secondary education and the limited time spent abroad.

All participants took part in the study completely voluntarily and agreed to being recorded for the purposes of this study. Participants were not revealed the actual goal of this study, in order to keep the results as objective as possible.

3.2 Materials

The target words for this experiment were embedded in a short text (an extract from Oscar Wilde's "The Devoted Friend" (1993), see Appendix A). This piece of text was chosen because almost all the sounds of interest occurred five times or more in the text. Furthermore, enough distractors were present as to avert the participants' attention from the actual goal of the study. Apart from being an extract, the text was also slightly adapted in places where this

was deemed necessary. This was done in order to fit three extra target words to achieve the amount of five target words per plosive, and to eliminate possible stumbling blocks after a test recording, in places where a pilot subject had difficulty reading the text fluently.

Five tokens of each voiced and voiceless plosive in English (/b, d, g, p, t, k/) were selected, resulting in thirty tokens per participant (240 tokens in total). All plosives were in word-initial position, sometimes in a syllable receiving primary stress and sometimes not. In the selection process of the target words, attention was paid to the sounds following the target sound, as well as to the sounds preceding the target sound, where running speech might result in reduced pronunciation of the target sound, or severely inhibit measurement of VOT. I.e. the tokens were in word-initial position and in a position in the sentence where reduction of the word was not likely to occur (“to” might get reduced in running speech). Furthermore, the tokens were followed by vowels as well as liquids, and a plosive was not preceded by a plosive of similar quality, nor by a full vowel that might result in a single speech segment in running speech (for example “every day”).

3.3 Procedure

The recordings were all made in a quiet room, with the least possible amount of outside noises. From the start of the experiment (starting at the opening of the door and the participant walking in), the participants were addressed in English throughout the remainder of the session, so as not to activate the participant’s Dutch (or German) language system. To get the participants into ‘English mode’, they were greeted in English by the experimenter (a non-native speaker of English), followed by two minutes of small talk in English. Then, participants were asked to read the instructions for the experiment (in English), followed by a restating of the instructions to eliminate any possible questions. A first text (the beginning of Oscar Wilde’s “Gentle Giant” (1993)) was read by the participants to focus him/her on the reading task at hand and allow the researcher to adjust the microphone volume and position if

necessary. The participant then read out loud the second text containing the thirty target words, and, after this, filled out a questionnaire concerning his/her linguistic background.

Recordings were all made using a Stagg condenser microphone connected to a computer in the Audacity software (Audacity Team, 2016) in a 32-bit, 44 kHz, mono wave format. The recordings were then analysed for VOT and annotated in PRAAT (Boersma & Weesink, 2016) based on both the waveform as well as the spectrogram. A first boundary was placed at the first burst of air, indicating the release of the articulators. A second boundary was placed at the beginning of regular vocal cord pulses visible in the waveform (regularity in the waves), as well as in the spectrogram (formant-structures visible for voice) (similar to Van Alphen & Smits, 2004; and Wunder, 2011). The time that elapses between these two boundaries is the VOT. The resulting values in ms were then entered into an Excel-sheet. If measurements were unclear due to mumbling or too low a volume of speech of the participant, that particular measurement was deemed unreliable and discarded from further analysis. This resulted in a total number of usable tokens of 220: 59 and 58 tokens for the monolingual and bilingual group respectively for the voiceless plosives, and 50 and 53 tokens (respectively) for the voiced plosives.

4. Results

4.1 Voiceless Plosives

Figures 1 and 2 are histograms showing VOT frequencies of the voiceless plosives in L2_{English} by the monolingual and bilingual group. A clear distinction between the two groups is visible when looking at the frequency of tokens that are produced within a certain VOT range.

Speakers in the monolingual group produced /p/ with a VOT between 10 and 40 ms in 17/20 cases, /k/ in the 30-60 ms range (14/19 cases), and /t/ in a more spread out VOT range with a peak (8/20) at 70-90 ms.

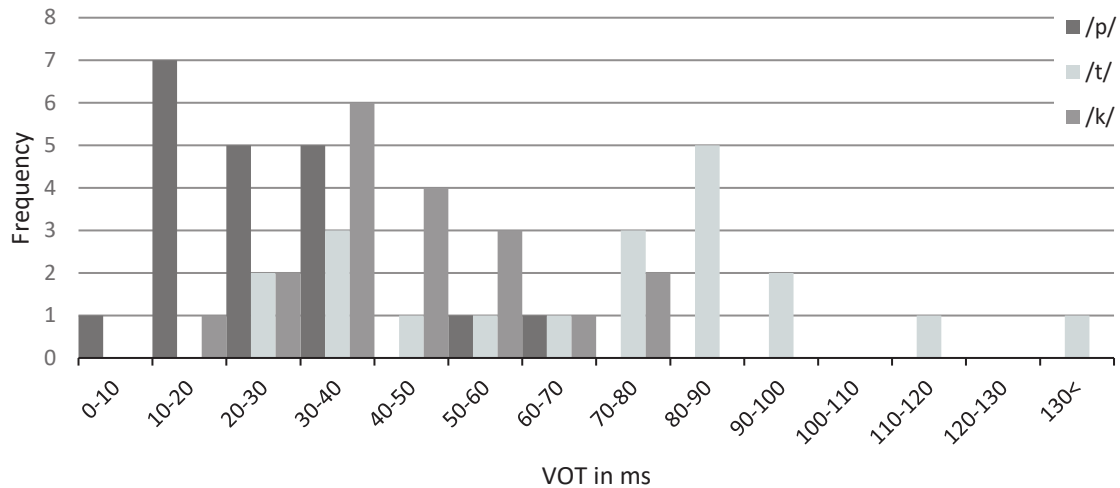


Figure 1. *Histogram of VOT values of voiceless plosives in L2_English by the monolingual group*

The bilingual speakers produced VOT values for /p/ between 20 and 40 ms in 10/19 cases, /k/ between 40 ms and 70 ms (12/19 cases), and no clear peak for /t/. Overall, it appears that the bilingual speakers have produced higher VOT values than the monolinguals.

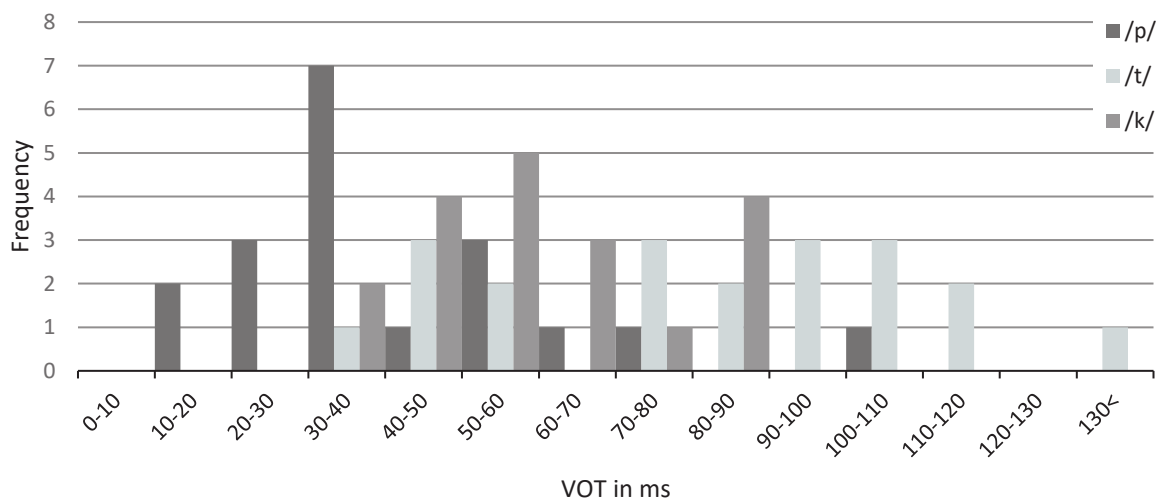


Figure 2. *Histogram of VOT values of voiceless plosives in L2_English by the bilingual group*

The mean VOT values and standard deviations for the separate voiceless plosives can be seen in Table 1.

Table 1. *Mean VOT values in ms (and standard deviations) for voiceless plosives in L2_English*

	Monolingual	Bilingual
/p/	25.1 (14.7)	42.0 (22.2)
/t/	70.8 (30.2)	82.3 (28.4)
/k/	41.6 (13.9)	59.5 (17.1)
Total	45.9 (28.3)	61.6 (28.3)

There is a considerable difference in these values between the monolingual and the bilingual speakers, with the bilinguals having higher VOTs than the monolinguals. This difference is also visible in the mean VOT values for the individual voiceless plosives, with /t/ having the highest mean VOT values, /p/ the lowest, and /k/ falling in between. This observation goes for both the monolingual as the bilingual group.

A two-way ANOVA reveals a significant difference between the plosives produced by the monolingual speakers and those by the bilingual speakers [$F(1, 116)=14.77$; $p=.0002$] as well as a significant difference between the individual plosives [$F(2, 116)=38.18$; $p<.0001$]. Thus, bilingual speakers produced longer VOTs than the monolingual speakers, additionally, /p/ was always produced with the shortest VOT and /t/ with the longest. No interaction between speakers and plosives were found.

4.2 Voiced Plosives

The results for the voiced plosives are presented in Figures 3 and 4. In the monolingual group, nine out of a total of fifty tokens (18%) were realised with pre-voicing, compared to 3 out of 53 tokens (6%) for the bilingual group.

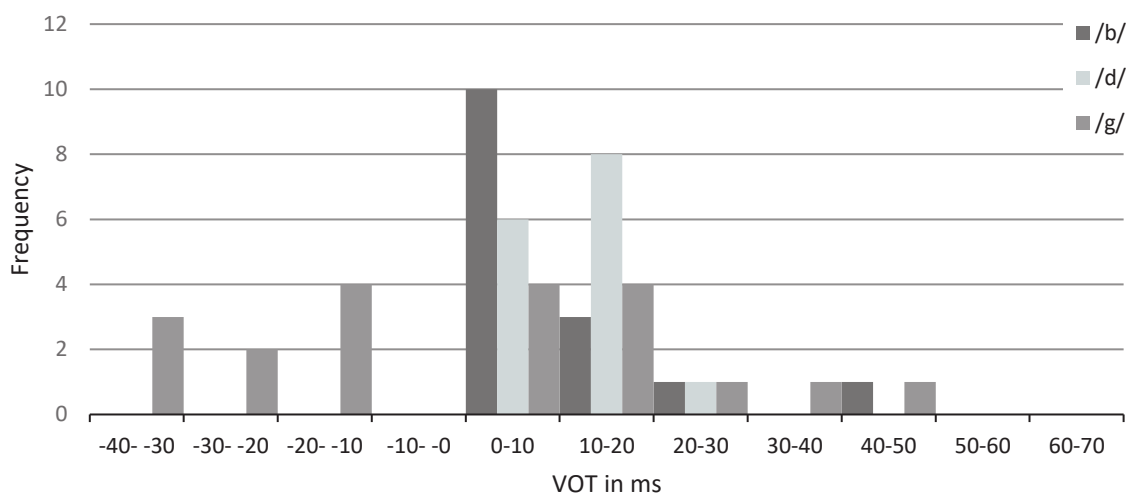


Figure 3. Histogram of VOT values for voiced plosives in $L2_{English}$ by the monolingual group

Speakers of the monolingual group produced /g/ with pre-voicing in nine out of twenty cases (45%), whereas the bilinguals showed pre-voicing in three out of 19 tokens (16%) and have a clear peak in the 0-9 ms range (11/19 tokens). /b/ is produced by the monolinguals with 0 to 20 ms VOT in 13/15 cases, when bilinguals produced /b/ with VOTs of 10-30 ms (10/15). The monolingual group had 14/15 tokens for /d/ with VOTs between 0 ms and 20 ms. Bilinguals produced 13/19 tokens at 0-20 ms for /d/.

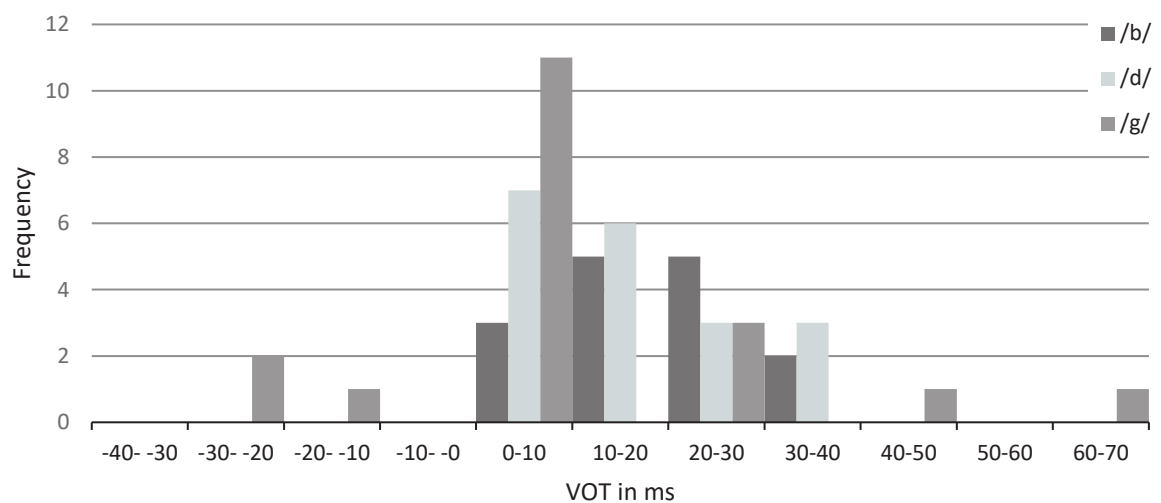


Figure 4. *Histogram of VOT values for voiced plosives in L2_{English} by the bilingual group*

Looking at the mean VOT values for both groups shown in Table 2, the bilingual group produced higher average VOTs than the monolingual group in all three voiced plosives. A two-way ANOVA reveals significant differences between the two groups [$F(1, 97)=4.17$; $p=.018$] and between the individual plosives [$F(2, 97)=5.69$; $p=.019$]. No interaction between speakers and plosives were found.

Table 2. *Mean VOT values in ms (and standard deviations) for voiced plosives in L2_{English}*

	Monolingual	Bilingual
/b/	7.8 (11.1)	16.3 (11.4)
/d/	9.5 (8.5)	13.8 (12.8)
/g/	-2.7 (24.4)	7.0 (22.2)
Total	4.1 (17.9)	12.1 (16.7)

5. Discussion

5.1 The Voicing Contrast in L2_{English} by Dutch/German bilinguals

The first two research questions concern the production of voiced and voiceless plosives in L2 English by L1 Dutch/German bilinguals and ask if these productions are closer to Standard Dutch, High German, or Standard English VOT reference values. The speakers from the bilingual group produced /p/ in-between the Dutch and English VOT range but within the German VOT range. /k/ was produced at the higher end of the German VOT range or the lower end of English VOT reference values for voiceless plosives. /t/, on the other hand, was produced above German VOT and within the English VOT range. Regarding the voiced plosives, a total of three out of 53 followed Standard Dutch voicing norms and were produced with pre-voicing. The other produced voiced plosives (except two) fall within the reference VOT ranges for voiced plosives in English and German.

In respect of the first two research questions regarding how Dutch/German bilinguals produce voiced and voiceless plosives in L2_{English}, these results show that, overall, the bilingual speakers produced VOTs in L2_{English} above Dutch reference VOT values and within the German and English VOT ranges. The fact that the Dutch/German bilingual speakers in this experiment produced voiceless plosives with longer VOTs than reference values in Dutch, but within German and English reference values, and values for voiced plosives that fall in varying ends of the German and English VOT ranges, indicates what Simon and Leuschner (2010) refer to as a “mixed system” in relation to the production of the voicing contrast in these bilingual speakers’ English.

5.2 VOT Values of Dutch/German Bilinguals and Dutch Monolinguals in L2_{English}

The third question asks how the VOTs of bilingual learners of L2_{English} and those of monolingual learners of L2_{English} compare to each other. The results concerning the voiceless plosives show that the monolinguals produced /p/ at the high end of the VOT range of Dutch voiceless plosives, whereas /t/ was produced in the English reference VOT range, and /k/ was

higher than the Dutch reference VOT values, but below the English VOT range for voiceless plosives. This is similar to the trend in VOTs produced by the bilinguals. The bilinguals, however, produced longer VOT values for each of the three voiceless plosives.

Though significantly lower than the VOTs for voiced plosives produced by the bilinguals, the monolinguals' /b, d/ were produced within the English reference VOT range. Only /g/ was below this range due to the number of pre-voiced items (9/20). All other tokens produced by the monolinguals (with the exception of three) fall within English reference values. This finding is contrary to previous studies which have suggested that voiced plosives in L2_{English} by native speakers of Dutch are produced much more frequently with pre-voicing than is the case in the present study (Simon, 2009; Simon & Leuschner, 2010).

Similar to the bilingual speakers, the monolingual speakers also show evidence of a mixed system, with both pre-voicing present in the voiced plosives as well as long-lag VOTs for the voiceless plosives. Furthermore, some of the voiceless plosives are produced within the Dutch VOT range, whereas others are produced in-between the Dutch and English reference VOT ranges, and even others are produced within the English VOT range. The VOT values that are neither within the system of the L1 nor within the target range of L2 VOTs are similar to what Wrembel (2015) found when looking at VOT in L3_{French} by L1_{German}/L2_{English} speakers. There, VOTs for L3_{French} were lower than English and German VOTs, but still above the French reference values. The fact that the speakers did manage to produce VOT values in L3_{French} that were significantly different from their L1/L2, but not within the reference VOT range is what she calls "compromise values".

Interesting to note in the productions of voiced plosives by the monolingual group, is that /g/ was the only plosive that was pre-voiced. It might be expected that they pre-voice /b/ and /d/ in L2_{English}, since these two plosives are present in the Dutch phonological system (while /g/ is not) and, thus, might be transferred into English which has the same plosives but

with a different realisation (see Flege, 1987). This is, however, not the case since /b, d/ are produced within the English VOT ranges and /g/ is pre-voiced in almost half of the cases.

5.3 CLI on L2_{English} VOT

The fourth research question concerned the differences in VOT values between the bilingual and monolingual speakers and if these might be explained by CLI from (one of) the native language(s) of a groups' speakers. The bilinguals produced higher VOTs for both the voiced and voiceless plosives than the monolingual speakers, which can be explained by CLI from the bilingual speakers' L1_{German}. There is a similarity between German and English with respect to the voicing contrast in these two languages, as they both have short-lag (unaspirated) stops for the voiced plosives and long-lag (aspirated) stops for the voiceless plosives. The Dutch/German bilinguals are likely to have transferred the German voicing system they had already acquired naturally into L2_{English}, resulting in VOTs that are close or equal to native English VOT values for both the voiced and voiceless plosives.

The fact that the Dutch monolingual speakers produced VOTs in voiced and voiceless plosives that were both significantly shorter than those produced by the bilinguals and fall below the native English VOT values, is a strong indicator for CLI from the native Dutch language's voicing system on L2_{English}. The overall relatively low number of pre-voiced tokens in L2_{English} could be ascribed to a high command of English in all participants of the present study. Van Alphen and Smits (2004), however, offer what could be a different possible explanation: the Dutch language is one of the few Germanic languages to distinguish between voiced and voiceless plosives with pre-voicing and short-lag (unaspirated) stops. They argue that, influenced by English, which is prevalent on tv and other media in the Netherlands, pre-voicing in Dutch might be diminishing. If this is true for the Dutch native speakers that participated in this study (at the time of participating in the study they reported being exposed to English language conversations and media between thirty minutes and five hours per day), this might also explain the relatively low number of pre-voiced tokens.

6. Conclusion and Suggestions for Further Research

This study set out to compare oral productions in L2_{English} by monolingual L1 speakers of Dutch and L1 Dutch/German bilingual speakers to see if the productions by the speakers of either group differ from the other group in terms of Voice Onset Time, and if this possible difference could be explained by Cross Linguistic Influence. For the voiced and voiceless plosives overall, significant differences between the two groups were found, with the bilingual speakers producing VOTs that fit within the German and English reference VOT values and are higher than those produced by the monolinguals. Differences between VOT length of the individual plosives were also observed in both groups. The fact that the Dutch/German bilingual speakers produced significantly longer VOTs than the monolingual speakers suggests positive transfer from the bilinguals' L1_{German} into L2_{English} has taken place, thanks to the similarity between German and English regarding the voicing contrast. The presence of VOT values produced by the monolinguals that match English reference values (in the case of /t/ and /b, d/) or do not match English reference values (in the cases of /p, k/ and /g/) indicates that the speakers have settled on compromise values, i.e. there is a sign of CLI from L1_{Dutch}.

The results concerning the voiced plosives are significant and show differences both between the monolingual and bilingual speakers in VOT length, and between the individual plosives. These findings are not in line with previous research on the subject where voiced plosives by Dutch monolinguals were found to be largely pre-voiced and, thus, have negative VOTs. Therefore, additional research on this subject is necessary. For studies on the differences in VOT between individual plosives, see among others Klatt (1975) and Cho and Ladefoged (1999).

In further studies, larger groups of participants will be needed to be able to obtain more reliable results and provide more conclusive evidence. Additionally, the speakers' L1(s) need(s) to be taken into account to provide a clearer view of the differences between the L1(s)

and L2 (or L_n) in speakers and eliminate the need to rely (as much) on the sometimes limited and/or dated reference data available for the respective L1. This can be done by taking VOT measurements from spoken productions in the speakers' L1(s) as well as in the L2 (or L_n).

These suggestions were not possible within the scope of the present study due to time constraints and limited access to Dutch/German bilingual participants.

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Appendix A

Slightly Adapted Extract from Oscar Wilde's "The Devoted Friend" (1993) (target words are underlined)

"Once upon a time," said the Linnet, "there was an honest little fellow named Hans."

"Was he very distinguished?" asked the Water-rat.

"No," answered the Linnet, "I don't think he was distinguished at all, except for his kind heart, and his funny, round, good-humoured face. He lived in a tiny cottage all by himself, and every day he worked in his garden. In all the country-side there was no garden so lovely as his. Sweet-Williams grew there, and Gilly-flowers, and Shepherds'-purses, and Fair-maids of France. There were damask Roses, and yellow Roses, lilac Crocuses and gold, purple Violets and white Tulips. Columbine and Ladysmock, Marjoram and Wild Basil, the Daffodil and the Pink Clover bloomed and blossomed in their proper order as the months went by, one flower taking another flower's place, so that there were always beautiful things to look at, and pleasant odours to smell.

"Little Hans had a great many friends, but the most devoted friend of all was big Hugh the Miller. Indeed, so devoted was the rich Miller to Little Hans, that he would never go by his garden without leaning over the wall and plucking a large nosegay, or a handful of sweet herbs, or filling his pockets with plums and cherries if it was the fruit season.

" 'Real friends should have everything in common,' the Miller used to say, and little Hans nodded and smiled, and felt very proud of having a friend with such noble ideas.

"Sometimes, indeed, the neighbours thought it strange that the rich Miller never gave little Hans anything in return, though he had a hundred sacks of flour stored away in his mill, and six brown cows, and a large flock of woolly sheep ; but Hans never troubled his head about these things, and nothing gave him greater pleasure than to listen to all the wonderful things the Miller used to say about the usefulness of true friendship."