

Fricatives In Loan Words

How Dutch speakers deal with English loan verbs containing a fricative sound

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Chapter 1 - Introduction

Many people in the Netherlands are L2 speakers of English. They traditionally are, through education and social, cultural and business contacts with native speakers. On top of that, English is now extensively available through systematically subtitled television and the internet. Therefore it is not surprising that many English words are entering the language. In the Dutch language, many English loan words are being used. Nicole van der Sijs has calculated how many loan words are being used on a single average newspaper page. In 2012, she found that 3.7% of the words were borrowed from English (p. 133).

Loans and new or pseudo-words can give information about the intuitions Dutch speakers have about the language. In the words of Ernestus and Baayen (2003), a relatively recent article that I will discuss below: "among the most fascinating data for phonology are those showing how speakers incorporate new words and foreign words into their language system, since these data provide cues to the actual principles underlying language" (p. 5). These authors looked at new or pseudo-words with obstruents in a neutralized position to learn about the intuition Dutch speakers have about one aspect of the phonology of their language. They have conducted an experiment in which they asked the participants to write down the past tense of pseudo-verbs that they heard with a stem-final obstruent neutralized by the phonological rule of final devoicing. This gave the investigators information about how speakers interpreted the underlying [voice] quality of the obstruents. This paper will also look at the interpretations of [voice] quality of a class of obstruents in verbs, namely fricatives. Where Ernestus and Baayen use pseudo-words, however, this paper addresses the other type of words they mention as "fascinating data", namely "foreign words" (p. 5). More specifically, this paper will look at how English loan verbs ending in a stem-final fricative

sound function in the Dutch phonological system, hoping in a similar manner to gain insight in the intuitions that Dutch speakers have about the phonological system of their language.

This paper will look at how Dutch speakers deal with stem-final fricatives in English loan verbs with respect to the pronunciation of the infinitive and the choice of the past tense morpheme to find out whether loan verbs function the same as Dutch verbs in the Dutch phonological and grammatical system. As in Ernestus and Baayen's case, the choice of past tense morpheme reveals the speaker's interpretation of the voice quality of the fricative at the end of the stem of the verb. However, given Dutch grammar and the notion of an underlying, 'basic' stem form of the verb, this choice should be consistent with that used in the infinitive: in an existing case which follows the rules, neutralized *ik zwerf*, past tense *ik zwerfde [-vd-]* and the infinitive *zwerfen* all go together, just as, without any changes, *ik blaf*, *blafte* and *blaffen*. Notice that the past tense morpheme has one of two forms conforming to the voicing value of the stem-final obstruent appearing in the infinitive. This system will be further explained in the section 2.1, 'Past tense system in Dutch'. So, loan verbs were chosen as a subject of investigation because both the pronunciation of the infinitive and the choice of past tense morpheme can give information about the phonological system of the participants. Verbs with fricatives are chosen, because in Dutch fricatives are a class of phonemes which is more subject to variation with respect to the pronunciation than other classes of obstruents. (Booij, 1995, p. 7).

The central question is whether loan verbs function the same as Dutch verbs in the Dutch phonological and grammatical system. That is, whether a *-te* past-tense morpheme is always chosen together with a voiceless pronunciation and a voiced pronunciation of the fricative always combined with a *-de* past tense morpheme. In order to answer this question an experimental approach will be taken. First an analysis will be made of the pronunciation of the infinitive of the fricative sounds in loan verbs by the participants to see whether they

produce a voiced or a voiceless sound. Secondly, their choice of past tense morpheme for these verbs will be analysed. A consistent relation between pronunciation of the infinitive and choice of past tense morpheme is expected to occur. If such a consistent relation is not found for (some) loan verbs, this paper will look at whether this may be because of the mechanisms that are at work in loan words. These mechanisms, described by Frans van Coetsem (1988), are further explained in the section 2.3, 'Effects of loan words'.

Chapter 2 - Theoretical framework

In this chapter the past tense system in Dutch will be explained in 2.1. Secondly, in section 2.2 the paper by Ernestus and Baayen is presented. Thirdly, in section 2.3 a theory on the phonology of loan words by Frans van Coetsem is presented. Finally, in section 2.4 the research question and hypothesis are stated.

2.1 Past tense system in Dutch

This study will look at the pronunciation of the infinitive and the past tense use of English loan verbs in Dutch to find out how these verbs function in the Dutch grammatical system. The past tense in Dutch for regular verbs is created by adding a suffix *-te* or *-de* to the stem of the verb. The stem of the verb is the infinitive minus *-en*. So for *werken* (to work) it is *werk*. The distinction between voiced and voiceless obstruents determines which suffix is chosen to form a past tense in Dutch. The suffix *-de* is used if the obstruent at the end of the stem is voiced and the suffix *-te* is used if the obstruent is voiceless. So verbs like *gaperen* (to yawn) and *blaffen* (to bark) will have *-te* as a suffix resulting in *gaapte* and *blafte*. Verbs such as *krabben* (to scratch) and *zweven* (to hover) will take a *-de* as suffix, resulting in *krabde* and *zweefde* [-vd-]. The fact that the choice of the suffix is based on the voicing features of the obstruent at the end of the stem is because of progressive assimilation: the onset of the suffix takes on the voicing features of the coda of the verb stem. This means that the obstruent at the end of the stem will determine whether the onset of the suffix is a voiceless [t] or a voiced [d].

2.2 Predicting the unpredictable: interpreting neutralized segments in

Dutch, a study by Ernestus and Baayen (2003)

As appearing from the quote given earlier, Ernestus and Baayen (2003) assume that how language-users handle foreign borrowings or new words shows something about what insight they have about the distribution of sounds in their language and how this knowledge is applied by them (p. 5). Ernestus and Baayen wanted more insight into what knowledge speakers use when they deal with neutralized obstruents of which they do not know the underlying [voice] specification. They wanted to find out whether listeners know that a segment in a neutralizing position in an unknown word can be realized differently in a non-neutralizing position, namely, that the surface representation may differ from the underlying representation. If speakers know the realization of a segment in non-neutralizing positions they know the underlying qualities of that segment in a neutralizing position. For unknown words they do not know these realizations, so they have to make a guess about the underlying specifications of the neutralized segment (p. 6-7).

Ernestus and Baayen suggest that speakers may use different strategies, these strategies each indicate towards a grammar that is differently organized:

Hypothesis 1 Speakers make the assumption that the segment has the same characteristics in non-neutralizing position as in neutralizing position.

Hypothesis 2 Speakers ascribe one of the possible underlying representations to the neutralized segment randomly.

Hypothesis 3 Speakers use the phoneme that has the strongest position in the phonology of the language as the underlying representation. The strength of voiced obstruents in Dutch is summarized in the following hierarchy [A]:

Hierarchy A: bilabial stop > alveolar stop > alveolar fricative > labiodental fricative > velar

fricative (p. 7).

This hierarchy follows from a number of phonological phenomena of Dutch discussed by Ernestus and Baayen.

Hypothesis 4 Speakers choose the phoneme that results in a morpheme that is like other comparable morphemes in the lexicon. Thus the distribution of the underlying representations in existing morphemes in the speakers' lexicon forms the basis for their choice.

In their paper, Ernestus and Baayen first investigated the the Dutch morphemes in the CELEX lexical database ending in an obstruent that has both a voiced and a voiceless variant in Dutch, and that is preceded by [er] or [en]. Of these nominal, verbal and adjectival morphemes the final obstruents are not neutralized for [voice] because they are followed by suffixes that start with a vowel (p. 9). However, these obstruents can be in neutralizing positions when the morphemes are used in isolation, i.e. when the obstruent is both stem- and word-final. Thus, looking at the [voice] specification of these obstruents will give insight in the underlying [voice] specification of neutralized segments in Dutch (p 9). They find that "neutralized obstruents should more often be assigned an underlying [+voice] specification if they are high in the following hierarchy:

Hierarchy B: velar fricative > labiodental fricative > alveolar fricative > alveolar stop > bilabial stop" (p. 8).

Bilabial stops are underlyingly voiced 9% of the time, alveolar stops 25%, alveolar fricatives 33%, labiodental fricatives 70% and velar fricatives 97% (p. 9). This hierarchy is the opposite of hierarchy A associated with hypothesis 3. Hypothesis 4 also predicts that speakers look at correlations between the underlying [voice] specifications of final obstruents of the morphemes in their lexicon (p. 9). Ernestus and Baayen have looked at whether such correlations are present in Dutch, by looking into an existing database, namely CELEX, and

found that the quality of the preceding vowel or consonant as well as the type of obstruent gives information about the underlying voice qualities of the obstruent. With respect to the correlations between the quality of the preceding vowel or consonant and the voice qualities they found that obstruents are more often underlyingly voiced after long vowels (p. 11). This is especially the case for fricatives, which are generally underlyingly voiced following long vowels and l,r.

To test the hypotheses about the distribution of voicing qualities for obstruents in neutralized positions in unknown segments by Dutch speakers, Ernestus and Baayen conducted a production experiment. Pseudo-words were presented to speakers of Dutch. They had to interpret whether the final, neutralized obstruents in these words were underlyingly voiced or voiceless (p. 13). Therefore, participants were asked to write down the past tense of a non-existing verb that they heard in a phrase consisting of the non-existing verb in the first person singular present tense combined with the personal pronoun *ik* (p. 13). Because the final obstruents of the verb forms are word-final they are phonologically neutralized for [voice] because of final devoicing (p. 14). “Thus the choice of the suffix reveals the participants’ phonological interpretation of the presented neutralized obstruents” (p. 13). Nearly all possible rhyme structures of Dutch were represented in the 192 non-existing monosyllabic verb forms that were presented to the participants (p. 14). 28 subjects participated in the experiment.

The results of the experiment showed that the participants interpret 24% of the pseudo-verbs, which were all realized with voiceless obstruents, as having an underlyingly voiced obstruent. So they do not ignore the neutralization, which falsifies hypothesis 1 (p. 15). Hypothesis 2 is falsified by the fact that Dutch speakers do not randomly use the feature voice in the past tense. For instance, the large majority of the past-tense forms after a velar fricative is *-de*. Also, for bilabial stops over 90% of the past-tense forms chosen is *-te*. If the

participants would have chosen randomly, a more even division between *-de* and *-te* would have been found for each of these obstruents (p. 15). Also, unlike the prediction of hypothesis 3, they do not base their choice for the [voice] specification of neutralized obstruents on the relative phonological strengths of the voiced variants of these obstruents. On the contrary, the percentage of choices for underlying [+voice] specifications increases from bilabial stops to velar fricatives, which is the opposite of Hierarchy A that was predicted by hypothesis 3 (p. 16). Instead they used their knowledge of existing words to decide which obstruent was the underlying obstruent when hearing segments in a neutralizing position as was predicted by hypothesis 4. Ernestus and Baayen found the same pattern with their participants as with existing words. This can be seen in that Hierarchy B is followed because, as mentioned above, the percentage of neutralized obstruents that is interpreted as underlyingly voiced increases with the least voicing assigned to bilabial stops and the most to velar fricatives. Also, similar correlations are found as in the CELEX database of existing words between the underlying [voice] specification and properties of the final rhymes. For instance, the participants assigned voicing qualities more often to obstruents that were preceded by a long vowel (p. 16). Using different prediction models Ernestus and Baayen show that the majority choice of the participants is predicted correctly in the large majority of the cases. A comparison between the predicted percentages of *-de* by these models and the actual percentage of *-de* chosen by the participants for pseudo-words shows a bias towards a voiceless interpretation of the neutralized obstruent. This corresponds to the "fact that the majority of the final obstruents in the lexical [CELEX] database (65%) are underlyingly voiceless" (p. 17).

What Ernestus and Baayen have shown is "that the underlying [voice] specification of final obstruents in Dutch words, instead of being an arbitrary lexical property of these words is lexically structured. [...] the predictions of the models based on existing words for novel experimental words are in line with the choice patterns of the participants: both the

participants and the models show that the unpredictable can be predicted after all" (p. 32).

Ernestus and Baayen have looked at how listeners distribute the past tense in unfamiliar verbs. Because of the fact that all the input of first person singular forms of the pseudo verbs used in the experiment ended in a voiceless sound there may have been a bias towards voiceless obstruents. This is indeed the case, because only 65% of the existing words has an underlyingly voiceless obstruent and 76% of the words in their experiment is interpreted as underlyingly voiceless. So the bias they found in the results may not only be because of the fact that the majority of the final obstruents in the lexical database are underlyingly voiced as they observe, but also because of the way they conducted the experiment with only voiceless input. Also, they did not investigate how listeners would pronounce the infinitive of the given first person singular pseudo-word. In writing down the past tense of a word the participants have made a conscious choice for a voiced or voiceless sound. So apart from phonology, active awareness may have played a role. On the other hand, the pronunciation of the given pseudo-word in the infinitive is not an active choice by speakers, but automatically generated by the phonological system of the speaker. Thus, this would have given a more direct view into the phonology, without other mechanisms or conscious thought playing a role. Therefore, this paper will look at both the pronunciation of the infinitive of the loan verbs and the choice of past tense morpheme to obtain information about the phonological rules active in language-users when they use loan verbs containing a fricative at the end of the stem.

2.3 Effects of loan words

Ernestus and Baayen have looked at how Dutch speakers deal with pseudo-verbs. However, as already mentioned by these authors loan words are also interesting to look at in this respect, because just like pseudo-words they are new words that have to be incorporated in an existing phonological system by speakers of Dutch.

According to Frans van Coetsem (1988), three phonological changes can occur in loan words when they enter a new language: adaptation, imitation or spelling pronunciation. In the case of adaptation the loan word is phonologically adapted to the recipient language. On the other hand, in the case of imitation the speaker will try to imitate the sounds of the source language and the result will be a deviation from the recipient language (p. 9). When a deviation is integrated into the recipient language, the phonological system of a recipient language will have changed due to the phonology of the loan words. Van Coetsem further explains how some aspects of the phonology of a language are more receptive to change than others. For instance, the spreading of a phonological constituent may change more easily than the constituent itself (p. 28). In addition, consonants are less stable in word-final position than they are in word-initial position and within a syllable a foreign constituent seems to find its way faster into the coda than into the onset (p. 32). Sometimes when a foreign sound enters a language through a loan word a partial imitation of the sound is made as a compromise between the native language and the source language (p. 113). According to Van Coetsem this seems to be the case with /ʃ/ and /ʒ/ which are borrowed from French into Dutch as *s+j* and *z+j*. In the case of the fricatives in the loan verbs in the experiment no new sounds are present, but the phonotactic distribution of these fricatives could change, because of a different distribution of the fricatives in the loan words than in the Dutch system. In chapter 5, 'Discussion', these mechanisms will be considered for deviating results.

2.4 Research question and hypothesis

This paper examines how Dutch speakers deal with English loan verbs containing a fricative sound. The paper will focus on whether the stem-final fricatives in English loan verbs behave the same as the fricatives in Dutch verbs with respect to their pronunciation and choice of past tense morpheme. The central question is whether these loans follow the general grammatical patterns of Dutch phonology and morphology, i.e. the rules for past tense and infinitive formation discussed above in section 2.1. Taking an experimental approach, I will look at the pronunciation of the infinitive and the choice of past tense morpheme for loan verbs. By doing so I hope to find a correct correlation between the pronunciation of the infinitive of the verb and the choice of past tense morpheme for the verb. Thus, always finding a *-de* morpheme in the past tense together with a voiced pronunciation of the fricative in the infinitive and a *-te* morpheme along with a voiceless pronunciation. The distribution of the fricatives and past tense morphemes will also be compared to the figures Ernestus and Baayen have found in the CELEX database of existing words. This will be further explained at the beginning of Chapter 5 'Discussion'. If some of the loans in the experiment show a deviation from the Dutch system in pronunciation and/or past tense formation I will look at whether this could be because of one of the mechanisms suggested by Frans van Coetsem described in section 2.3.

Chapter 3 - Method

As described in the Introduction to this thesis, the topic of fricatives in loan verbs will be approached experimentally. In this chapter I describe the experiment in 3.1 to 3.4. Also, the method of analysing the data will be described in 3.5.

3.1 The experiment

The experiment consisted of two parts. Dutch speakers were first asked to pronounce Dutch sentences containing English loan verbs, Dutch verbs and nonsense verbs based on Dutch nouns and adjectives. The selection procedure for these verbs will be discussed in section 3.3. The utterances by the subjects were recorded, in a setting and procedure described in the procedure section 3.2. After that, the same subjects were asked to fill in the past tense of exactly the same verbs in sentences that had a gap at the position of the verb by choosing a *-de* or *-te* suffix.

3.2 Procedure

In part 1 of the experiment participants were presented with a list of 51 Dutch sentences in random order for each participant (<http://textmechanic.com/Randomize-List.html> was used to randomize). They were asked to read these sentences out loud. The subjects sat at a table in a quiet part of the house while reading the sentences. The voice recorder was lying on the table at approximately 40 centimetres from the participant. The subjects were instructed to silently read the sentences before reading them out loud to avoid hesitation because of unknown words. The pronunciation was recorded using a voice recorder (Olympus WS-570M) at 44.1k.

In part 2 of the experiment, participants were presented with a list of 51 Dutch past-

tense sentences. Their task was to fill in the past-tense form of the verb between brackets in past tense sentences with a gap at the place of the verb, by choosing a *-de* or *-te* suffix. They had to write the full past tense form of the verb. The verbs were the same as the verbs in part 1 of the experiment. The assumption is that the choice of the suffix shows whether the subject interpreted the fricative in the verb as voiced or voiceless, recall section 2.1. The participants were asked to write down the full past-tense forms. No items could be left open, so the subjects had to choose also in cases when they doubted about an item. The participants were instructed to ignore the rules of the Dutch spelling system in cases where they conflicted with their intuition about an item. For example, this could be the case with *exercisen*, because the spelling rules prescribe a *-te* past tense morpheme, while the pronunciation of the verb with a [z] would result in a *-de* past tense morpheme.

A list of the sentences that were presented to the participants is given in Appendix 1.

3.3 Materials

The participants were presented with sentences that contained different types of verbs:

English loan verbs, Dutch verbs and nonsense verbs based on Dutch nouns and adjectives.

The English loan verbs were included to answer the question whether these loans function the same as Dutch verbs in the Dutch grammatical and phonological system with respect to the pronunciation of the infinitive and the choice of past tense morpheme. In some of the items the English pronunciation of the fricative in the loan verbs in the experiment corresponds to the spelling of the verb, in other cases a [z] is spelled with an s. For example, in *exercisen*. In some items the English pronunciation is in accordance with the Dutch phonological system as researched by Ernestus and Baayen (2003) which is described above in section 2.2. In other items, like *buzzen*, this isn't the case, because with the short vowel [ʏ] a voiceless fricative [s]

is expected, while the English pronunciation of this verb is a voiced fricative [z]. The Dutch nonsense verbs were control material to check the influence of spelling on the pronunciation, because they can be compared to the Dutch verbs and English loan verbs with the same sound pattern and a different spelling. The Dutch verbs were included as a reference point to see whether participants apply the rules of the system as described in section 2.1 above, or perhaps show different behaviour. Four Dutch verbs that show to have a lot of variation by looking at the use of these verbs on the internet (*wijzen, reizen, eisen, krijzen*) were included to check how consistent the participants are in applying the past tense suffixes. Several benchmarks containing a fricative in mid-vocal position were included to function as reference points for the sound analysis.

Using this methodology, the experiment resulted in a sound file with the pronounced verbs in sentences and a form on which the participants filled in the past tense for each of the verbs.

Appendix 2 gives a table of all the verbs used in the experiment along with a phonological transcription of the verbs.

3.4 Participants

The participants were 21 native speakers of Dutch, ages 22 to 60. Of the participants 8 were male and 13 were female. Most of the speakers came from the centre of Holland. A few speakers grew up in the south of Holland. The subjects had a varying educational background. The subjects were no experts of English. However, the way they pronounced the loan verbs shows that they were familiar with the English language. For instance, the verb *groven* was pronounced as [gro:ven] only one time and as [gru:ven] the rest of the times. Also, verbs like *exercisen* and *advertisen* are pronounced with an [ai] vowel instead of, for instance, an [i:] as the spelling suggests.

3.5 Analysis

The analysis of the recordings was done by using the program *Praat* (Boersma and Weenink, 2010). This program can analyse sound recordings. The classical distinction between voiced and voiceless fricatives based on the presence or absence of activity of the vocal cords is not sufficient to measure whether a fricative counts as voiced or voiceless in the phonological system that is discussed in this paper. The reason this is not sufficient is that not all speakers use voicing to distinct these sounds. For instance, Slis has found that only in 20% of the pronunciation of /v,z/ of the written words in his experiment voicing was present (1989,130). Therefore, he has researched other factors that can be measured to find out whether a fricative is voiced or voiceless. Slis showed that “the mean duration of [-voice] fricatives is significantly longer than that of [+voice] ones under all conditions” (1989, 129). Stevens (1992) has also researched this topic. In his experiment on voicing in fricatives “the calculations also show that the amplitude of the frication noise is weaker for the voiced than for the voiceless fricative” (1992, 2981). Therefore, in the experiment in this thesis two factors were measured in order to determine whether the sound was a voiceless or a voiced fricative: the length of the fricative and the intensity at the centre of the fricative. The length was manually determined. After that, the program *Praat* calculated the intensity at the centre of the fricative based on this length.

After collecting the length and intensity for each fricative per subject, the average length was measured for the items containing an [s,z]. The fricatives were labelled according to the scheme below.

Both values significantly (5%) below average	Voiced [z] [v]
One value below average and one average	Voiced [z] [v]
Both values significantly above average	Voiceless [s] [f]
One value significantly above average and the other average	Voiceless [s] [f]
One value significantly below and one value significantly above average	No label
Both values average	No label

The same procedure was done for verbs containing a [f,v].

The large majority (88%) of the instances of [f] and [s] had a length that was more than 15% above the average length. Also, the [f] and [s] in the benchmark items *bessentaart* and *effen* nearly always had a length that was more than 15% above average length. Therefore it was decided to leave out the items with an [s] or [f] that had a length of less than 15% above average. 37 possible instances of [s] and 16 possible instances of [f] were excluded from the results (=5%). This was done to be sure that none of the items included in the results were wrongly labelled [s] or [f]. Because the items that had both values on average had already been excluded, this measurement resulted in a large gap in values between the items that were labelled voiceless and the items that were labelled voiced. In total, this ensured that all of the items that were included in the results were actually as labelled, without any cases of doubt that may possibly be the opposite fricative.

Chapter 4 – Results of the experiments

In this chapter the results of the experiment will be presented. First in section 4.1 the results of the first part of the experiment on the pronunciation of the infinitive will be presented per item. This will be followed by the results of this part of the experiment presented per test subject. In section 4.2 the results of the second part of the experiment on the choice of past tense morpheme based on what the participants filled in as a past tense form of the verbs in the sentences will be presented. Again, first by looking at the items and after that by looking at the subjects.

4.1 Pronunciation of the infinitive

4.1.1 Pronunciation of the infinitive per item

Table 1 shows the pronunciation of the fricative for each of the verbs in the experiment. The items that show most variation the results are highlighted in grey, where ‘most variation’ is defined as at least 5 results for each possible pronunciation, resulting in correspondingly low results for the other two possible results: the alternative pronunciation and ‘not included’.

Recall from section 3.5 that the latter score is the result of the fact that the fricative could not be analysed and was excluded from the results.

	s	z	not incl.
buzzen	4	14	3
kussen	20	0	1
knuzzzen	11	6	4
socializen	1	18	2
customizen	0	19	2
exercisen	0	20	1
advertisen	1	17	3
maizen	3	16	2
Thaisen	20	0	1
Boeklezen	0	19	2
fundraiszen	4	14	3
protheszen	4	17	0
traczen	19	1	1
reizen	1	19	1
wijzen	3	17	1
krijzen	17	1	3
eizen	13	4	4

	s	z	not incl.
quizzen	11	3	7
fitnesszen	14	2	5
misszen	18	0	3
leaszzen	9	8	4
freezen	2	15	4
pleaszzen	4	14	3
kiezzen	1	17	3
nieszzen	13	5	3
houszen	13	6	2
browszen	6	8	7
sauzen	0	18	3
kouszen	16	3	2
cruiszen	7	8	6
snoozzen	0	18	3
produczen	10	3	8
soezzen	2	16	3
moeszen	14	4	3

	f	v	not incl.
surfen	12	4	5
durven	0	20	1
smurfzen	9	8	4
skydivzen	0	13	8
opstijvzen	1	19	1
highfivzen	0	17	4
savzen	1	16	4
beven	0	17	4
briefzen	12	1	8
liefzen	18	0	3
dievzen	7	11	3
golfzen	12	4	5
kolvzen	3	15	3
wolfzen	13	7	1
movzen	0	19	2
groovzen	3	14	4
proevzen	1	19	1

Table 1: pronunciation of the infinitive for each item

See Appendix 3 for a complete overview of the pronunciation and past tense morpheme choice of each of the participants for each item.

Table 1 invites the following observations:

1. Observations on the choice of fricative.

- For all existing Dutch verbs a clear choice of either voiced or voiceless is made, except for *nieszzen*. The latter verb occurs among the ‘strong varying’ ones, whereas all others show a maximum of 4 subjects deviating from the majority in their pronunciation.
- The verbs that show most variation are *cruiszen*, *leaszzen*, *browszen* and *smurfzen*: for these verbs there is a difference of 1 or 2 between the number of subjects who pronounce a voiceless fricative and the number of subjects who pronounce a voiced fricative.
- The verbs *knuzzzen*, *nieszzen*, *houszen*, *dievzen* and *wolfzen* also show strong variation in the pronunciation: for these verbs five to eight subjects pronounce the fricative differently

from the rest and the difference between the number of subjects who pronounce a voiced fricative and the number who pronounce a voiceless fricative is 3 or more.

- Finally, below the figure of 5 for several (13) other verbs 3 or 4 subjects make a different choice than the majority: *buzzen, maizen, fundraisen, prothesen, wijzen, eisen, quizzen, pleasen, producen, moesen, surfen, golfen, grooven*.
- It can be noticed that there are six verbs where the fricative could not be analysed in Praat (as described in section 3.5 on the analysis of the fricatives) for a substantial number of subjects: *quizzen, browsen, cruisen, producen, skydiven, briefen*.
- Of the three verbs in the test spelled with –zz-, *buzzen* is mainly pronounced with a voiced sound, *quizzen* is mainly pronounced with a voiceless sound and *knuzzen* shows 'strong variation' with a small minority towards a voiceless pronunciation (11 out of 17).
- Of the two verbs with –rf, the Dutch verb *smurfen* is in the class of eight verbs with the largest amount of variation, whereas the English loan *surfen* is mostly pronounced with an [f].

2. Observations on the vowel preceding the fricatives

- For the English loan verbs with [aɪ] almost all participants pronounce a [z], also for the verbs that are spelled with an s. Also *skydiven* and *highfiven* are pronounced with a [v]. However, the Dutch nonsense verb *v thaisen* is pronounced with an [s]
- The three loan verbs *leasen, freezezen* and *pleasen*, which all contain an [i:] sound with slightly uncharacteristic vowel length preserved in Dutch from the source language, show different patterns in the pronunciation. *Freezen* is consistently pronounced with a [z]. With *pleasen* there is some variation in the pronunciation: four subjects deviate from majority and pronounce an [s]. For *leasen* there is even more variation as there is no majority choice.

- With *housen* with [aʊ] most participants pronounce an s. For *browsen* almost as much subjects pronounce the verb with an s as with a z (6 and 8 respectively) A similar pattern is seen in *cruisen* with a (long) [u:] (7 and 8 respectively).

The chapter of “Discussion” below will speculate on what may have caused these experimental results and concomitant observations.

4.1.2 Pronunciation of the infinitive per subject

Let us now look at the pronunciation characteristics of the individual participants. Table 2 shows the data for each subject, age, sex and place where the person lived for the first 12 years of his or her life. The number for each subject is the number of the recording that was made with the voice recorder.

number	gender	age	place of residence in Holland for the first 12 years of life
58	m	24	middle
59	f	22	west
60	f	36	middle
61	f	48	south
62	m	52	middle
63	f	25	middle
64	f	28	west
65	f	26	west
67	f	27	middle
68	f	24	middle
69	f	35	north
70	f	30	south, north
71	f	33	middle
72	f	23	middle
73	m	40	middle
74	m	28	middle
75	f	56	middle
76	m	60	middle
78	f	26	middle
79	f	24	north
80	m	26	west

Table 2: data for each subject

Figure 1 below shows the total test results per subject. Figure 2 shows for each of the subjects how many times they deviate from the majority and which fricative they chose in those cases and in the cases where there was no clear majority towards either voiced or voiceless for an item. Where 'no clear majority' is defined as the items when the difference between the number of subjects who pronounce a voiceless fricative and the number who pronounce a voiced fricative is 2 or less.

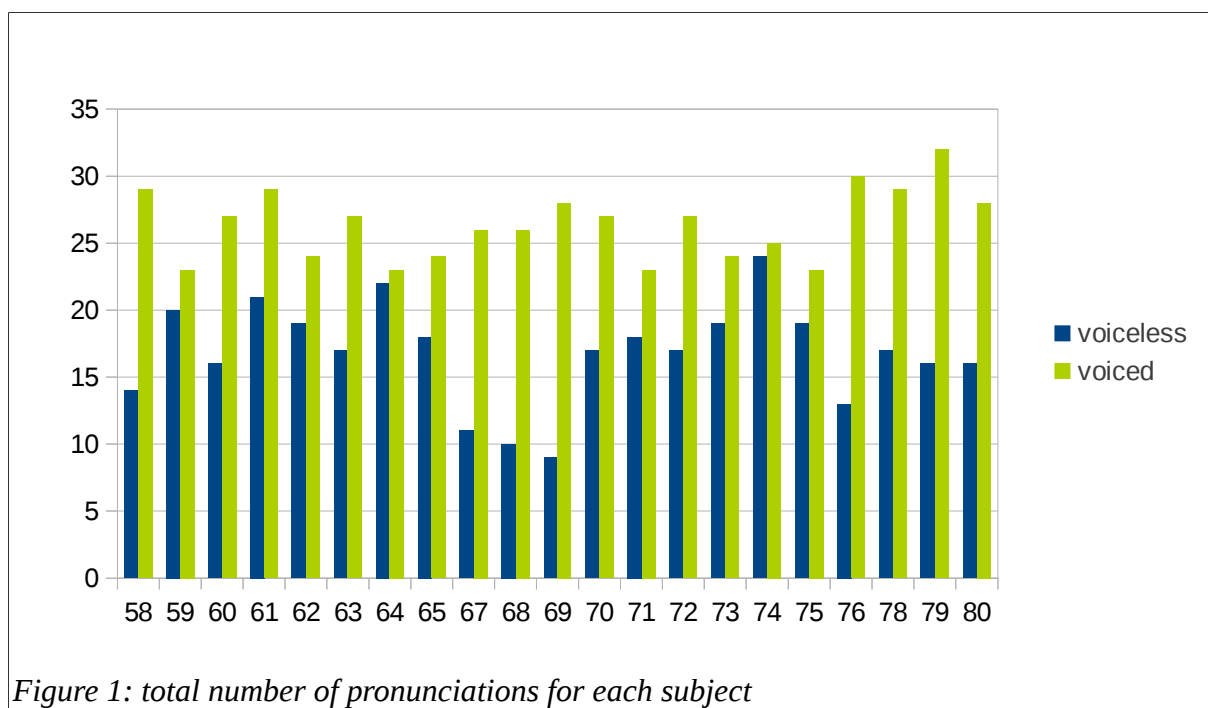


Figure 1: total number of pronunciations for each subject

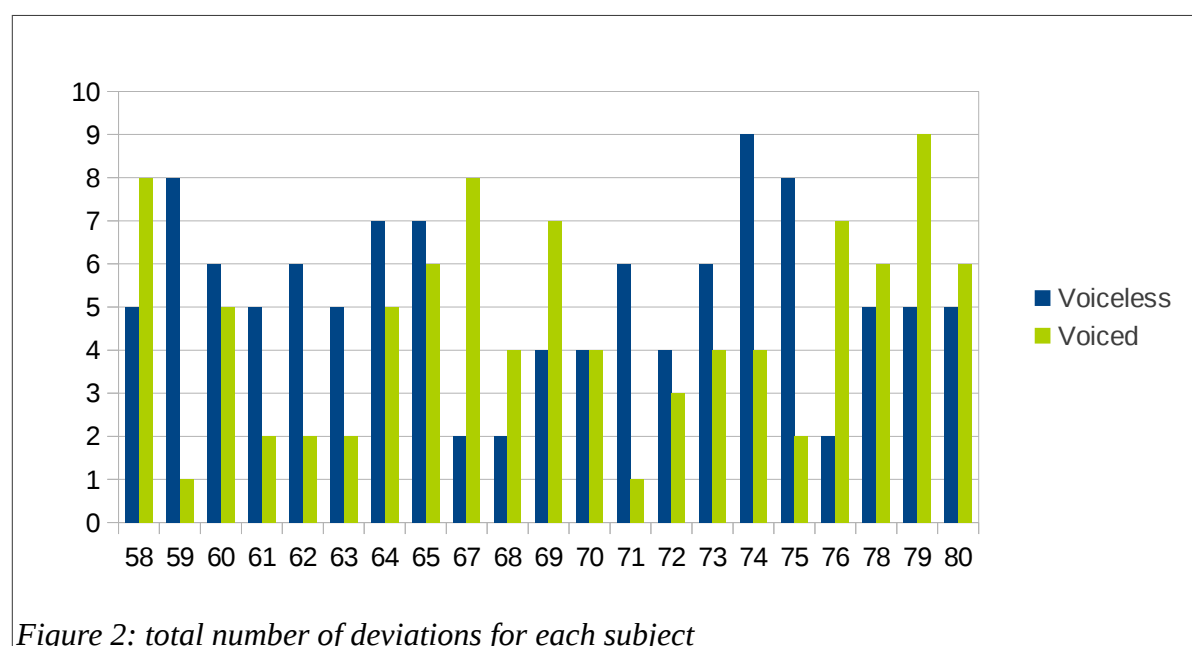


Figure 2: total number of deviations for each subject

The following observations can be made on the basis of these figures:

- Figure 1 shows that all of the subjects use more voiced fricatives than voiceless ones.
- Eight subjects show a larger contrast (11 or more voiced pronunciations than voiceless ones) than the others: 58, 60, 67, 68, 69, 76, 78, 79.
- Figure 2 shows that four subjects deviate from the majority for more items (13 or more) than other subjects, these subjects are: 58, 65, 74, 79.
- Seven of the subjects in Figure 2 deviate more towards voiceless with a difference of 3 items or more: 59, 61, 62, 63, 71, 74, 75. Five deviate more towards voiced with a difference of 3 items or more: 58, 67, 69, 76, 79. The remainder of the subjects deviate approximately as much towards voiced as voiceless with a difference of 1 or 2 between the numbers of voiced and voiceless pronunciations.

Chapter 5 'Discussion' will discuss whether age, sex or [place of birth] may play a role in these differences between subjects.

4.2 Choice of past tense morpheme

With these results for pronunciation in mind it is interesting to see which past tense morphemes are chosen in the past tense in the past tense experiment. The spelling pattern of the past tense verbs that the participants wrote down was ignored in the analysis of the past tenses, because in the instructions the participants were clearly told not to focus on expressing the spelling of the past tense test output form, but just to focus on the choice of *-de* or *-te*.

4.2.1 Choice of past tense morpheme per item

Table 3 shows the total choices of past tense morpheme for each of the verbs in the first two columns. The third column shows the total of results that deviate from the Dutch grammatical system as described in handbooks and grammar literature (recall section 2.1), which is either a voiced pronunciation and a *-te* past tense morpheme or a voiceless pronunciation combined with a *-de* past tense morpheme. For the items that have the largest number of deviations the figure in this column is highlighted in green. 'The largest number' is defined here as 6 or higher. In the remaining columns of the table the full results for the combinations of the pronunciation of the infinitive and the choice of past tense morpheme is shown.

	Total de	Total te	deviating	S/f+ te	s/f+de	Z/v+te	z/v+de	de	te
buzzen	16	5	1	4		1	13	3	
kussen	1	20	1	19	1				1
knuzzen	14	7	8	4	7	1	5	2	2
socializen	21	0	1		1		18	2	
customizen	19	2	1			1	18	1	1
exercisen	11	10	9			9	11		1
advertisen	17	4	5		1	4	13	3	
maizen	21	0	3		3		16	2	
Thaizen	8	13	7	13	7			1	
Boeklezen	17	4	4			4	15	2	
fundraisen	18	3	3	2	2	1	13	3	
prothesen	13	8	8	2	2	6	11		
tracen	7	14	8	12	7	1			1
reizen	19	2	3		1	2	17	1	
wijzen	17	4	3	2	1	2	15	1	
krijzen	1	20	2	16	1	1			3
eisen	0	21	4	13		4			4
quizzen	17	4	12	1	10	2	1	6	1
fitnessen	3	18	2	13	1	1	1	1	4
missen	0	21	0	18					3
leasen	10	11	11	4	5	6	2	3	1
freezen	17	4	5		2	3	12	3	1
pleasen	18	3	5	1	3	2	12	3	
kiezen	10	11	7	1		7	10		3
niesen	3	18	5	12	1	4	1	1	2

	Total de	Total te	deviating	S/f+ te	s/f+de	Z/v+te	z/v+de	de	te
housen	8	13	8	8	5	3	3		2
browsen	7	14	9	7	5	4	2		3
sauzen	17	4	4			4	14	3	
kousen	3	18	4	14	2	2	1		2
cruisen	7	14	5	6	1	4	4	2	4
snoozen	18	3	2			2	16	2	1
producen	9	12	3	8	2	1	2	5	3
soezen	18	3	4		2	2	14	2	1
moesen	5	16	7	10	4	3	1		3
surfen	11	10	5	8	4	1	3	4	1
durven	20	1	1			1	19	1	
smurfen	11	10	9	4	5	4	4	2	2
skydiven	17	4	4			4	9	8	
opstijven	18	3	3		1	2	17		1
highfiven	18	3	3			3	14	4	
saven	17	4	5		1	4	12	4	
beven	18	3	2			2	15	3	1
briefen	11	10	6	7	5	1		6	2
liefen	16	5	15	3	15			1	2
dieven	18	3	8	1	6	2	9	3	
golffen	15	6	10	3	9	1	3	3	2
kolven	18	3	5		3	2	13	2	1
wolfen	14	7	9	5	8	1	6		1
moven	19	2	1			1	18	1	1
grooven	19	2	2	1	2		14	3	1
proeven	18	3	4		1	3	16	1	

Table 3: total choices of past tense morpheme for each item

In Table 3 the following observations can be made on the results.

1. Observations on the choice of past tense morpheme

- For all of the verbs with a labiodental fricative a *-de* past tense morpheme is chosen more often than a *-te* past tense morpheme.
- For the verbs with an alveolar fricative there are roughly as many verbs where a *-de* morpheme is chosen by the majority as verbs where a *-te* is chosen by the majority: 17 and 14 respectively.
- For 13 verbs there is much variation in the choice of past tense morpheme, where 'much variation' is defined as a total of 7 or more for each of the morphemes. These verbs are: *knuzzen*, *exercisen*, *thaisen*, *tracen*, *leasen*, *housen*, *browsen*, *cruisen*, *producen*, *surfen*, *smurfen*, *briefen* and *wolfen*.

2. Observations with respect to the combination of the pronunciation of the infinitive and the choice of past tense morpheme:

- For *buzzen* all four subjects who have pronounced a voiceless [s] in the infinitive also chose a *-te* in the past tense, whereas for *knuzzen* several subjects (7) pronounced an [s] and chose a 'de' in the past tense. With *quizzzen* almost all of the subjects (11 out of 14) pronounced the verb with an s. Yet most subjects (17 out of 21) chose a *de* in the past tense.
- The verb *exercisen* is pronounced with a [z] and in the past tense a 'te' is frequently chosen: 9 times. For *advertisen*, which has a similar sound and spelling pattern there is less discrepancy between pronunciation and choice of past tense morpheme: only 5 deviating combinations are made. For the Dutch nonsense verbs with the same sound pattern *maizen* a *-de* is chosen for past tense by all of the participants, also by those who pronounced the infinitive with an [s]. *Thaisen* shows variation in the past tense (18 *-de*, 13 *-te*), while all subjects pronounced the infinitive with an [s].

- The Dutch verb *boeklezen* shows some variation in choice of past tense morpheme (4 *-te*), while in the test it was pronounced with a [z] by all participants.
- For *tracen* almost all of the participants had pronounced the verb with an s while eight subjects chose a *de* in the past tense. For *fundraisen* only two subjects made this deviating combination.
- For *leasen* it can be noticed that eleven subjects chose the past tense morpheme that does not fit the pronunciation.
- With *kiezen* seven subjects who had pronounced the verb with a z chose a *te* in the past tense. A similar pattern can be seen in the verb *sauzen* where four subjects show this deviating combination.
- The verb *browsen* is often pronounced with an s (8 times) while almost half of the number of participants chose a *-de* in the past tense.
- For *cruisen*, the pronunciation of voiced and voiceless is almost evenly divided, while in the past tense mainly *te* is chosen (14 out of 21).
- *Briefen*, *liefen* and *dieven*, all verbs with a labiodental fricative and an [i:] vowel all show deviations in the combination of pronunciation and past tense morpheme (6, 15 and 8 respectively).
- *Golfen* and *wolfen* are both mainly pronounced with an [f]. However, in the past tense a *-de* is chosen most of the time (12 and 13 times respectively), resulting in many deviating combinations (10 and 9 respectively). The Dutch verb *kolven* is mainly pronounced with a [v], so no such deviations occur for that verb.

The chapter 'Discussion' below will discuss what may be the reason behind the deviations in combinations of infinitive pronunciation and choice of past tense morpheme for these items.

4.2.2 Choice of past tense morpheme per subject

Also for past tense formation it is interesting to look at each participant specifically. Figures 3 and 4 show the total of *-te* and *-de* choices for each participant, divided by type of fricative.

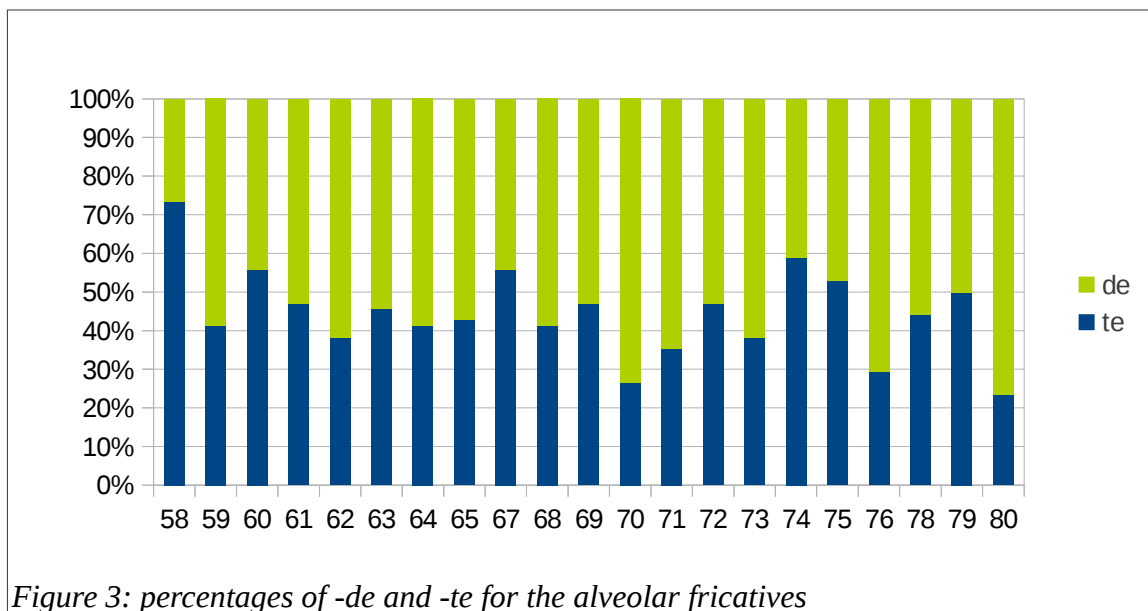


Figure 3: percentages of *-de* and *-te* for the alveolar fricatives

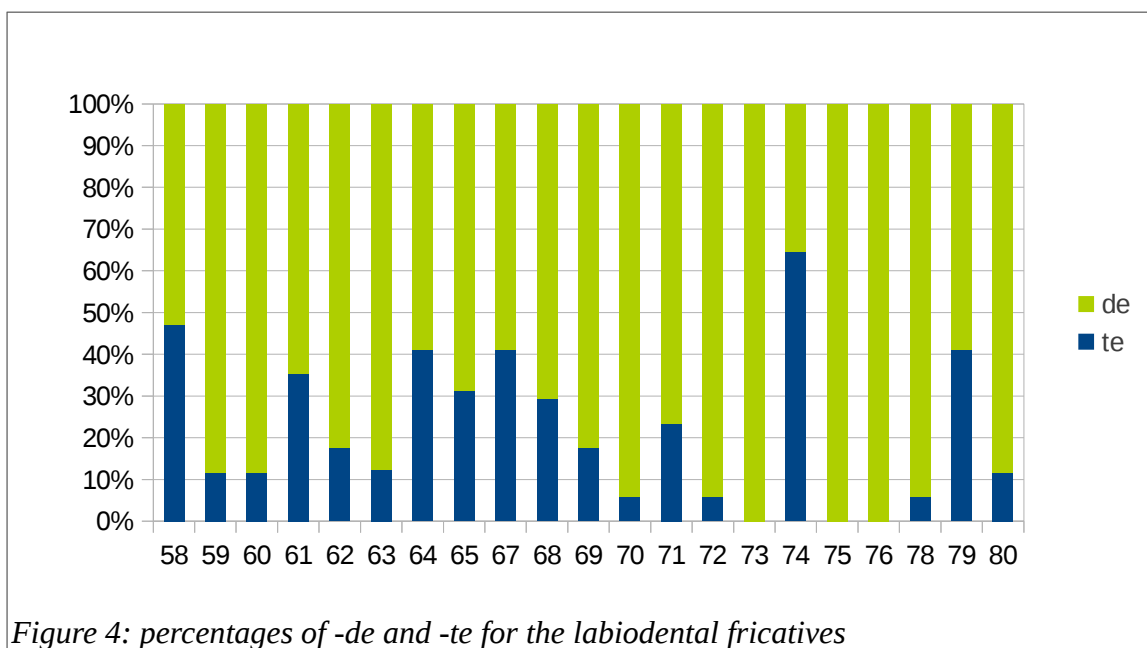


Figure 4: percentages of *-de* and *-te* for the labiodental fricatives

Figures 5 and 6 show the totals of the pronunciation divided by type of fricative.

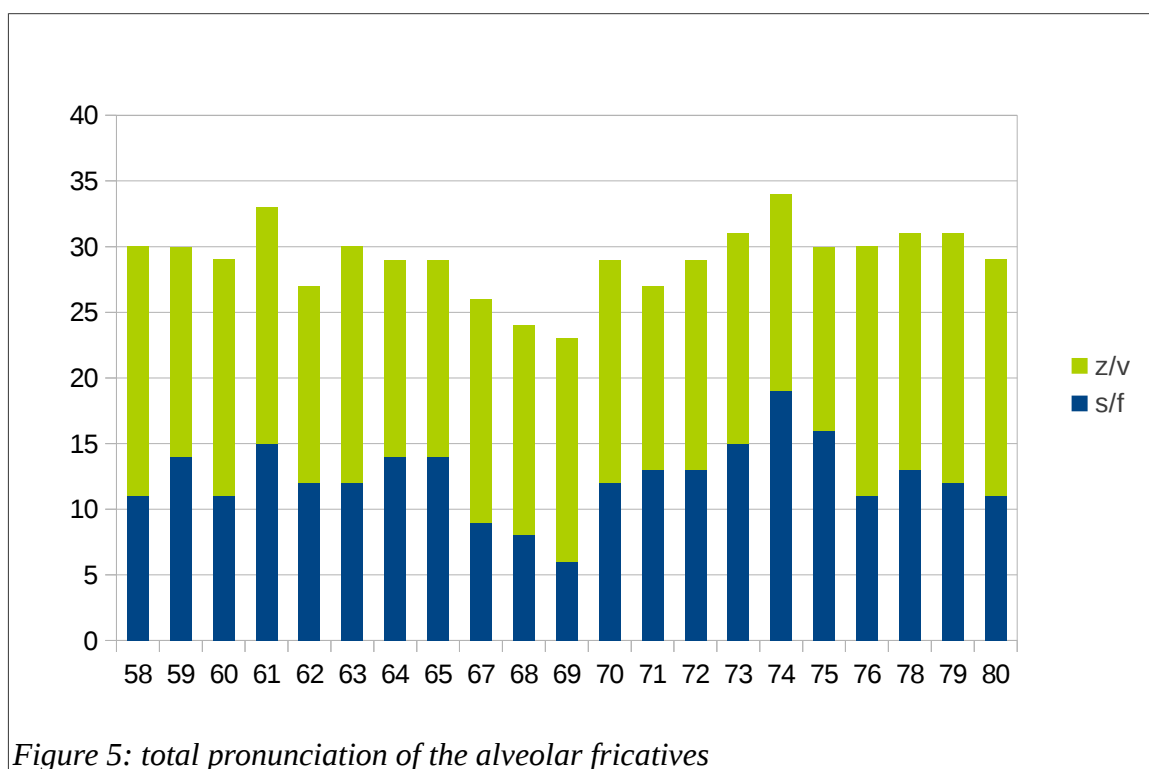


Figure 5: total pronunciation of the alveolar fricatives

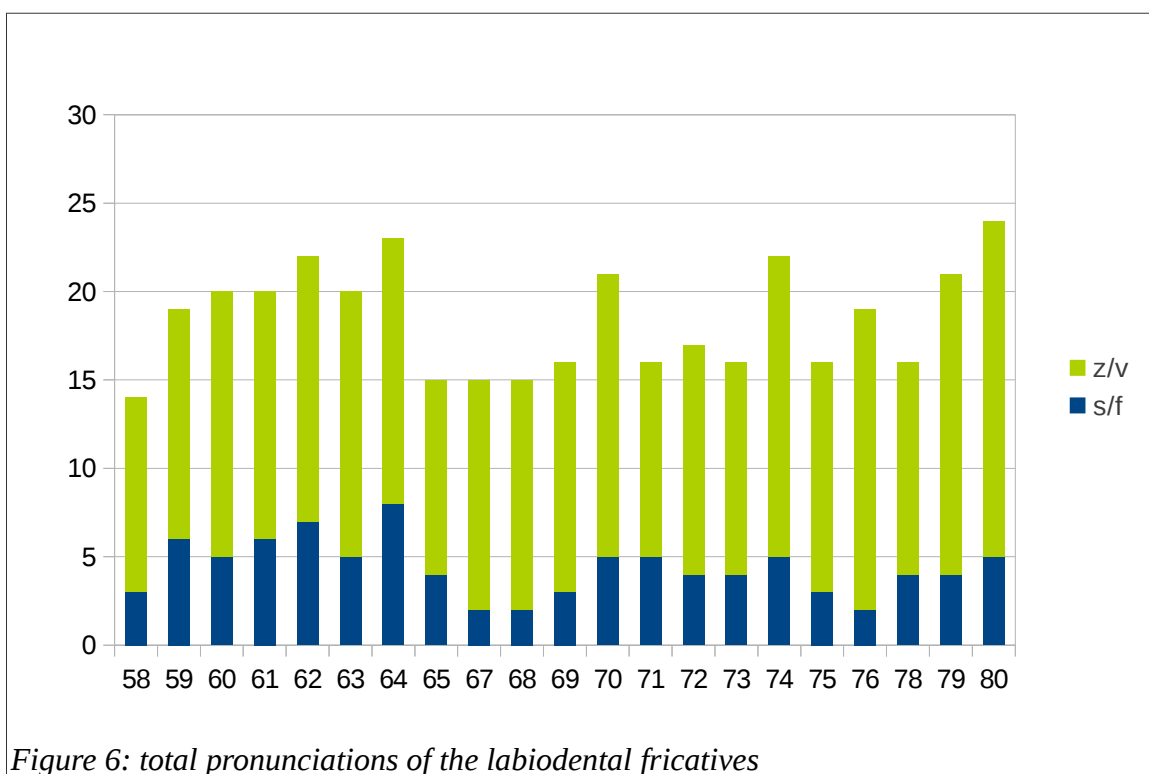


Figure 6: total pronunciations of the labiodental fricatives

In Figures 3 to 6 the following observations can be made:

- These figures show that *-de* is chosen more often than *-te* for all of verbs with a the labiodental fricatives. The corresponding pattern is seen in the pronunciation for these fricatives, that more often a [v] is pronounced than an [f].
- Figures 3 and 4 show that four subjects chose a 'te' more often, more than 50% of the time, these subjects are: 58,67, 74, 79.
- Figure 4 shows that six subjects have chosen a *-de* for all of the verbs with a labiodental fricatives, or for all except one: 70,72,73,75,76,78.

Figures 7 and 8 show the combinations of pronunciation and choice of past tense morpheme for each subject divided by type of fricative.

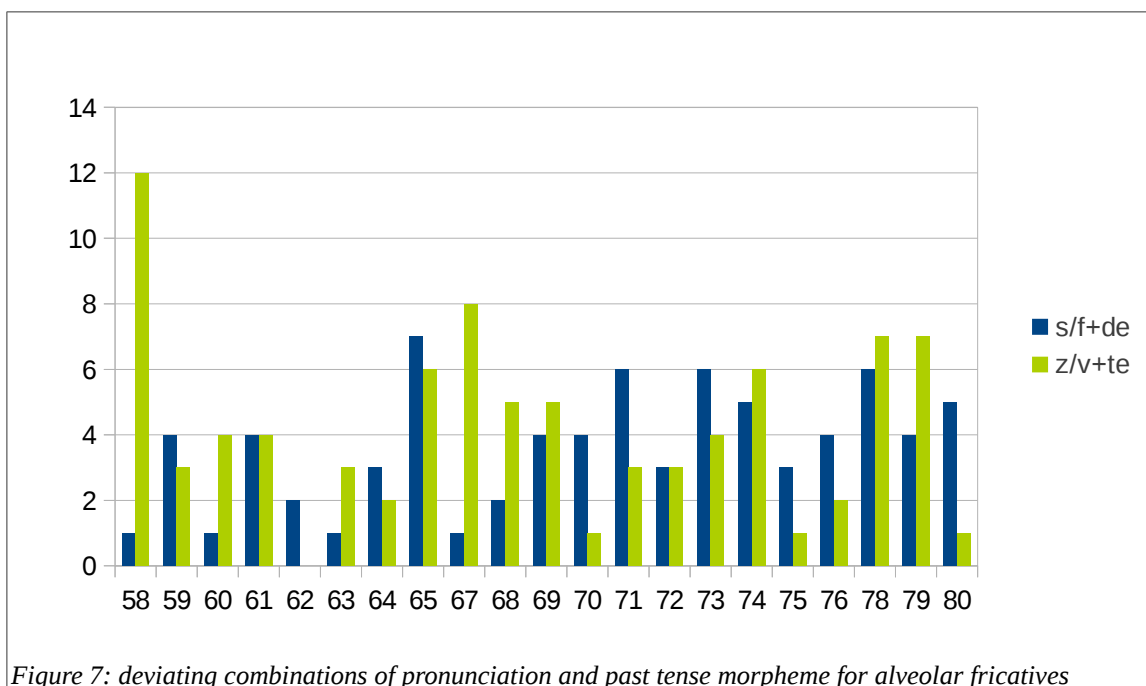


Figure 7: deviating combinations of pronunciation and past tense morpheme for alveolar fricatives

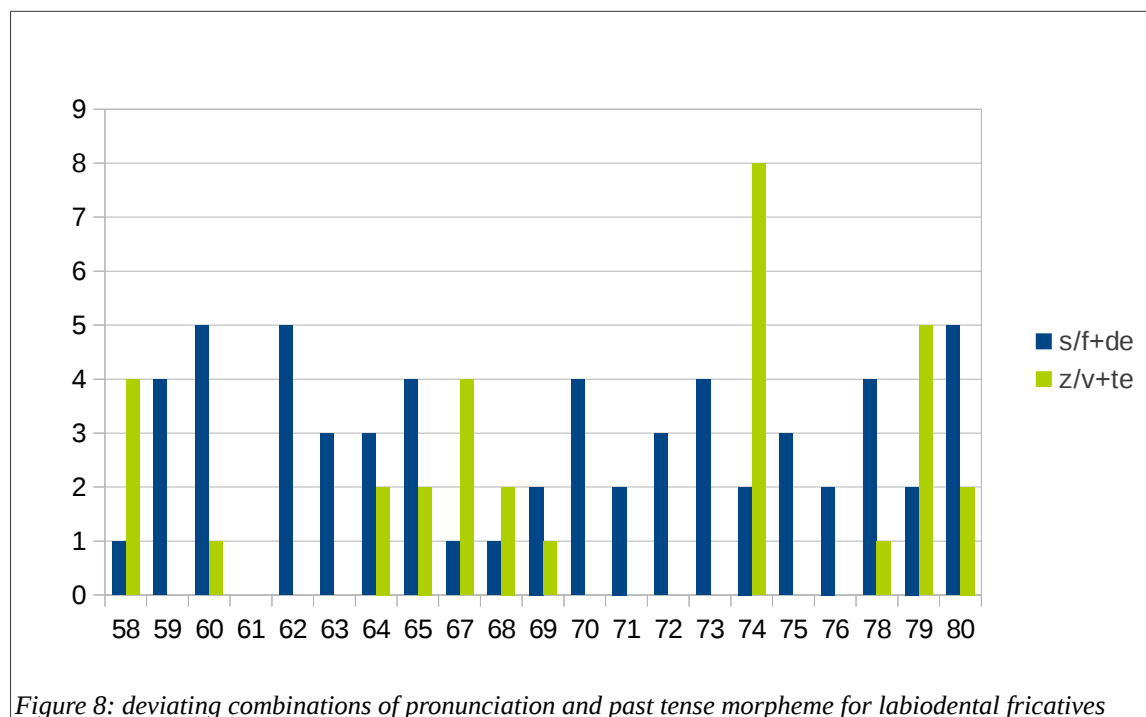


Figure 8: deviating combinations of pronunciation and past tense morpheme for labiodental fricatives

Figures 7 and 8 show the following:

- Five subjects make more deviating combinations, 18 or more, of infinitive pronunciation and choice of past tense morpheme than the other subjects do: 58,65,74, 78,79
- Five of the subjects have more than 5 more deviating combinations with a *-te* in the past tense and a voiced pronunciation of the infinitive than the other way around: 58, 67, 68, 74,79.
- Seven other subjects have more than 5 more deviating combinations of a voiceless pronunciation with a *-de* in the past tense than the other way around: 59, 62, 70, 71,73, 75,80.
- For the rest of the subjects the difference between the type of deviating combinations they make is 4 or less.
- For the labiodental fricatives more deviating combinations are made between a voiceless sound in the infinitive pronunciation and a *-de* morpheme in the past tense than the other way around.

Why these subjects make these deviating combinations and whether there is a relationship with how these subjects pronounce the fricatives in the infinitive will be discussed in chapter 5, 'Discussion', below.

Chapter 5 – Discussion

The aim of this thesis paper was to ascertain whether the English loan verbs in the experiment behave the same as Dutch existing verbs do in the Dutch phonological and grammatical system as described in section 2.4. That is, whether a *-te* past-tense morpheme is always chosen together with a voiceless pronunciation and a voiced pronunciation of the fricative combined with a *-de*. In doing so it was borne in mind that the existing Dutch verbs also do not always behave precisely according to these rules, as has become apparent from literature such as Ernestus and Baayen (2003) discussed in section 2.2. The first part of the experiment consisted of finding out how the subject pronounced the fricative in the infinitive and the second part of the experiment dealt with the past tense morpheme they chose by filling in the past tense for these verbs in sentences provided on paper. In this chapter I will speculate on the results of the experiment described in chapter 4 by looking at the results for the items in 5.1 and the results for the subjects in 5.2.

In the sections below I will refer to the figures in the paper by Ernestus and Baayen several times. Here, a general explanation about the referral to these figures is given. Ernestus and Baayen (2003) have looked in the CELEX lexical database at words that “consist of a nominal, verbal or adjectival base morpheme ending in an obstruent of which both the voiced and the voiceless variants are phonemes of Dutch, and that is followed by the comparative suffix ([-ər]), the infinitive suffix ([-ən]) or the plural suffix [-ən]” (p. 9). These nominal, verbal and adjectival base morpheme, which can be in neutralizing positions when they are used in isolation provide information on the underlying [voice] specification of neutralized obstruents in Dutch. They found that bilabial stops are underlyingly voiced 9% of the time, alveolar stops 25%, alveolar fricatives 33%, labiodental fricatives 70% and velar fricatives

97% (p. 9). This entails that for the corresponding words with the suffixes [ər] and [ən] these ratios are the same. Therefore, when relevant, in the section below the results of the words in this experiment, which are also words ending in such a suffix, thus belonging in the same category, will be compared to these figures Ernestus and Baayen have found.

5.1 Discussion of the items

Below in section 5.1.1 to 5.1.4 the results of the experiment for the items will be discussed in several categories. In 5.1.1, the items will be discussed by type of verb: Dutch existing verb, Dutch nonsense verb and English loan. In 5.1.2 the items will be discussed by type of fricative. In 5.1.3 the items will be discussed by type of vowel preceding the fricative. In 5.1.4 the items will be discussed by looking at spelling issues.

5.1.1 Dutch existing verbs vs Dutch nonsense verbs vs English loan verbs

For the Dutch existing verbs, the verb *niesen* has significant variation with respect to the pronunciation of the infinitive. This may be because there is also a version of the verb spelled with a z as can be seen in the *Van Dale* (www.vandale.nl) dictionary. The fact that two spellings of this verb occur is probably because there are two possible pronunciations. In this experiment the variant with an s was chosen, because the experiment already included a verb with an [i:] vowel and a z sound, namely *kiezen*. All of the other Dutch existing verbs are pronounced consistently just as is expected with familiar verbs. The exception is the verb *smurfen*, which is known from the animation show where it is used by the smurfs as a verb that can replace all other verbs. For this verb there is much variation in the pronunciation in the experiment. However, maybe not all of the subjects were familiar with this verb, because

they may not have watched this show. Therefore it could also be regarded as a nonsense verb. For these existing Dutch verbs it is expected that they follow the Dutch grammatical system. With an average of only 2.5 deviations per item this is largely the case. However, for all items there are some exceptions where a deviating combination is made. Most (40 out of 52) of the deviating combinations that are made are of a voiced fricative combined with a *-te* past tense morpheme. As Ernestus and Baayen point out, in the CELEX lexical database they tested the majority of the words (65%) ended in an underlyingly voiceless fricative. Therefore also the majority of the words with a [əɾ] or [ən] suffix has a voiceless fricative (recall the introduction to this chapter 5). If this observation is taken as a ‘fact’ about Dutch, this may in the current experiment have resulted in the fact that the majority of the existing verbs is voiceless could result in a bias towards a choice of a voiceless past tense morpheme in this experiment.

For the nonsense verbs there is some variation in the pronunciation, Specifically for the verbs *knuzzen*, *dieven*, *smurfen* and *wolfen*: 6 or more subjects pronounce the minority choice. Maybe the existing adjective *knus* and nouns *dief* and *wolf* (with the plural *wolven*) have interfered in the pronunciation for these verbs. For the verbs *moesen* and *kousen* such a stem also exists. These verbs do not show the same variation. However, in the case of the nouns *moes* and *kous*, the stem ends with the same voiceless fricative as the nonsense infinitive. So, there is no interference from these stems. As for the combination of past tense and pronunciation of the infinitive there are more deviating combinations made for the nonsense verbs than for the Dutch existing verbs: an average of 7 deviations per nonsense item. For these nonsense verbs most (59 out of 78) deviating combination are made of a voiceless fricative and a *-de* past tense morpheme, which is the opposite as with the existing verbs.

For most of the loan verbs there are only a few (5 or less) subjects who pronounce the

verb differently from the rest. Several (4) verbs, however, show a more varying pattern of pronunciation, where 'more varying' is defined as 6 or more for each of the two pronunciation: *leasen*, *housen*, *browsen* and *cruisen*. For these verbs the English pronunciation may have interfered, because in English these verbs are pronounced with a [z] while they are spelled with an s. Except for *leasen*, which has an English pronunciation with an [s]. However, *pleasen*, has a pronunciation with a [z], as have other English loan verbs with this spelling pattern, like *teasen*. So this may have caused confusion as to the pronunciation of *leasen* for the subjects. With respect to the past tense morpheme and the infinitive more deviating combinations are made than for the existing Dutch verbs, but less than the Dutch nonsense verbs: an average of 5.5 per item. So the grammatical rules of the past tense system are less consistently applied to English loan verbs than they are to existing Dutch verbs: 2.5 versus 5.5. As pointed out, the cause may be interference from the English pronunciation. For the English loans, roughly as many deviations of the type 'voiced fricative combined with a *te* past tense morpheme' as of the type 'voiceless fricative combined with a *de* past tense morpheme' are made: 58 and 69 respectively.

So the Dutch grammatical rules of the past tense are less consistently applied to the English loan verbs than to the Dutch existing verbs. This may be because of interference from the source language. This is in line with what Frans van Coetsem has described about loan words, namely that sometimes speakers will try to imitate the sounds of the source language and the result will be a deviation from the recipient language (1988, 9).

5.1.2 Alveolar vs labiodental fricatives

The alveolar fricatives in the experiment are pronounced with an [s] almost as much as with a [z]: 14 and 17 times, respectively. Ernestus and Baayen (2003) found that 33% of the alveolar fricatives of the words ending in [ər] and [ən] in the CELEX database were voiced (recall the

explanation in the introduction to this chapter). So in this experiment the ratio is different. This may be because of the loan verbs in this experiment. For three verbs there is not a majority choice: *leasen*, *browsen*, *cruisen*. Note that these are all loan verbs that have a voiceless spelling, but a voiced pronunciation in English. These two conflicting facts may have resulted in the high degree of variation. The results of the past tense experiment show that in the past tense a *-de* morpheme is chosen as a majority as much as a *-te* for the verbs with an alveolar fricative. So the same ratio of voiced and voiceless is seen in the past tense as in the pronunciation of these verbs with an alveolar fricative.

Most of the verbs (11 out of 17) with a labiodental fricative are pronounced with a voiced [v] compared to a voiceless [f]. This is in line with the ratio that Ernestus and Baayen found in the CELEX database for Dutch words, which was 70% of the labiodental fricatives being voiced for the words ending in the suffixes [ən] and [ər]. For the labiodental fricatives, there are five verbs that the majority of the subjects pronounced with an [f]: *surfen*, *briefen*, *liefen*, *golffen*, *wolffen*. Together with the verb *smurfen*, these are the only verbs in the experiment that are spelled with a voiceless *f*. So the spelling may play a role in the pronunciation of these verbs with an [f]. For all of the verbs with a labiodental fricative a *-de* morpheme is chosen most frequently. This may be because of the fact that most (70%) of the words with a labiodental fricative ending in an [ər] or [ən] suffix in the CELEX database are voiced. Therefore subjects may have chosen a *-de* past tense morpheme as a default for the labiodental items they were unsure about. That is, they interpreted the labiodental fricatives they were unsure about as voiced, because the 70% of the labiodental fricatives in similar words is voiced.

So in the comparison between alveolar and labiodental fricatives it can be seen that the labiodental fricatives are more often pronounced voiced and also a *-de* past tense morpheme is chosen most of the time.

5.1.3 Short vowels vs long vowels or diphthongs

For the verbs with a short vowel [ʏ, ɪ] most (26 out of 31) of the deviating combinations that are made, are of the type with a voiceless fricative in the infinitive and a *-de* past tense morpheme. Since most of these verbs are pronounced with a voiceless fricative in the pronunciation experiment, it is not surprising that deviations in this direction occur. For *quizzzen* and *knuzzzen* most subjects (10 out of 11 and 7 out of eleven respectively) that pronounce the verb with an *s* have chosen a *de* in the past tense. For *quizzzen* the pronunciation with an *s* may have been triggered by the independently existing noun *kwis* and for *knuzzzen* by the adjective *knus*. It could, however, also be the case that these verbs are mainly pronounced with an *s* because of the short vowel that precedes the fricative (recall the results of the experiment by Ernestus and Baayen in section 2.2). Then, the reason that a *de* is often chosen in the past tense may have been triggered by the spelling with a *z*.

Ernestus and Baayen have categorised diphthongs with the long vowels in their experiment. In this paper the same line will be followed. Most of the verbs with a long vowel or diphthong (24 out of 38) are mainly pronounced with a voiced fricative. The exceptions are: *thaiszen*, *traczen*, *nieszen*, *houszen*, *kouszen*, *produczen*, *moeszen*, *briefzen* and *liefzen* which are mainly pronounced with a voiceless fricative (figures were given in Table 1). These verbs are all spelled with a voiceless fricative (either *s* or the foreign spelling *c*) which may have caused a pronunciation with a voiceless sound. Also for the verbs *traczen*, *produczen* and *briefzen* this voiceless pronunciation may have been triggered by the English pronunciation of these verbs which may have interfered with the pattern of fricatives being voiced after a long vowel. For several (3) of the verbs a majority choice is not made: *leaszen*, *browszen*, *cruiszen*. In these cases, the long vowel preceding the fricative may have triggered the pronunciation with a *z* for half the number of the subjects, while the spelling with an *s* may have triggered a pronunciation with an *s* for the other half. Also, in the case of *browszen*, *cruiszen* and *houszen*

with [aʊ] the English pronunciation of the fricative, which is a [z] may have interfered.

So vowel type in terms of quantity seems to play a role in the pronunciation of the verbs as well as the choice of past tense morpheme. A discrepancy between the vowel quantity and either spelling or the English pronunciation may have been the cause of some of the deviations in the combination of the pronunciation of the infinitive and the choice of past tense morpheme.

5.1.4 Spelling issues

In the sections above a reference to spelling issues has been made several times. Also, Frans van Coetsem (1988) has described how spelling may be of influence in the pronunciation of loan verbs (as mentioned in section 2.3). In this section a closer look will be taken at the possible influence of spelling on the results of the experiment. Some of the fricatives in the experiment are spelled with a voiceless fricative, while the pronunciation according to the Dutch system would be a voiced fricative. These include verbs such as *exercisen* and *cruisen*. For several verbs, such as *exercisen*, *advertisen*, *cruisen* and *leasen*, many deviating combinations are made of the type of a voiced pronunciation and a *te* past tense morpheme. In these cases this may be because of the influence of the spelling with an *s* on the choice of past tense morpheme. This theory is supported by the fact that the verbs *socializen* and *customizen*, which contain the same vowel as *exercisen* and *advertisen*, but have a *z* spelling, no such deviating combinations are made. However, for the Dutch verbs *kiezen* and *sauzen*, several of the subjects chose a *-te* in the past tense (11 and 4 respectively), which goes against the hypothesis that spelling with a *z* results in the choice of a *-de* in the past tense. On the other hand, maybe these subjects would spell the verbs *sauzen* and *kiezen* with an *s* when given the choice. For the verbs *leasen*, *housen* and *browsen* spelling may also play a role in the variation in combinations of pronunciation and choice of past tense morpheme. This is

because the spelling with an *s* suggests a choice of *-te* and, as Ernestus and Baayen have shown, the long vowel before the fricative suggests the choice of a *-de* as a past tense. The English loans *cruisen*, *leasen*, *browsen* and *housen* show most variation (6 or more for each of the pronunciation options). This variation may have occurred because of the fact that these verbs are spelled with a voiceless *-s*, while the long vowels before the fricative may have triggered a voiced [z] sound. This [z] sound after long vowels is in line with what Ernestus and Baayen found in the CELEX database of Dutch words with a fricative sound.

The experiment also included verbs that are spelled with a *z* but would be pronounced with an [s] according to the Dutch phonological system. Verbs like *knuzzen*, *buzzen* and *quizzzen*. *Buzzen* is mainly pronounced with a [z]. This may be because of interference of the English pronunciation. *Knuzzen* and *quizzzen* are mainly pronounced with an [s]. As mentioned above this may be because of the nouns *knus* and *kwis* that have interfered.

The experiment also included verbs that are spelled with a *c* and pronounced with an [s] like *tracen* and *producen*. These verbs are consistently pronounced with a voiceless sound. However, for *tracen* a *-de* past tense morpheme is often chosen. This may be because of the spelling with a *c*, which may have confused the subjects, because it was not an *s* or *z*, but it could also be because of the long vowel preceding the fricative.

So spelling seems to play a role in the pronunciation of the infinitive as well as the choice of past tense morpheme. This is in line with what Frans van Coetsem has described, namely that a spelling pronunciation can occur in loan words.

5.2 Discussion of the subjects

In this section the test results will be discussed by looking at the individual results of the subjects. 5.2.1 will discuss how the items are pronounced by the subjects and 5.2.2 will discuss how the subjects dealt with the past tense in the experiment.

5.2.1 Pronunciation of the infinitive by subjects

The results show that all subjects pronounce more voiceless fricatives. Several (eight) participants show a greater difference between the number of voiced and voiceless pronunciations than others: 58, 60, 67, 68, 69, 76, 78, 79. Some (four) of the subjects deviate from the majority in their pronunciation of the fricative more often (13 or more) than others: 58, 65, 74, 79. Some of the subjects (seven) deviate more towards a voiceless pronunciation: 59, 61, 62, 63, 71, 74, 75. Others (five) more towards a voiced pronunciation: 67, 69, 76, 79. For these subgroups it is interesting to look at age, sex and place of upbringing to see whether these factors may explain these observations. For instance, by looking at in Table 2 it can be seen that the five subjects who deviate the most (18 or more times) have the following characteristics: 58: m, 24, middle; 65: f, 26, west; 74: m, 28, middle; 79: f 24, north. This procedure of looking at the characteristics was repeated for all the subgroups above. This revealed that no common factor of age, sex or place of birth can be found for the groups of subjects who show certain behaviour with respect to the pronunciation of the verbs.

5.2.2 Choice of past tense morpheme by subjects

Some subjects show different patterns compared to the others in their choice of past tense morphemes throughout the experiment. For instance, subjects 58, 67, 74, and 79 chose a *-te* significantly more often than the rest of the subjects. This may have been because they also deviate more towards a voiceless pronunciation of the verbs. However, Figures 5 and 6 show that this is not the case and that only one of these four subjects (74) deviates more towards a voiceless pronunciation. Some of the subjects have chosen a *-de* for all of the labiodental fricatives. Ernestus and Baayen have found that most (70 %) of the labiodental fricatives in word ending in [əɾ] and [ən] in the CELEX database are voiced. This may explain why these subjects chose a *-de* past tense morpheme when dealing with unfamiliar loan verbs.

The subjects making the largest number of deviating combinations (18 or more) are 58, 65, 74, 78, 79. The subjects making the smallest number of deviating combinations 61, 62, 63, 75, 76. Again no common factor of age, sex or place of upbringing can be found for these two groups.

Chapter 6 - Conclusions

The research question of this thesis was the following: do loan verbs function the same as Dutch verbs in the Dutch phonological and grammatical system? That is, is a *-te* past-tense morpheme always chosen together with a voiceless pronunciation and a voiced pronunciation of the fricative always combined with a *-de* past tense morpheme. To answer this question an experiment was conducted in which the participants were asked to pronounce the infinitive of a set of loan verbs, Dutch existing verbs and nonsense verbs. In the second part of the experiment the participants were asked to fill in the past tense for the same verbs in written past tense sentences with a gap at the place of the verb. The results show that there is more variation in the pronunciation of English loan verbs than in the pronunciation of Dutch existing verbs. This may be due to interference from the source language. Also, the Dutch grammatical rules of the past tense are less consistently applied to the English loan verbs than to the Dutch existing verbs. Furthermore, the results show that vowel type in terms of quantity and spelling seem to play a role in the pronunciation of the loan verbs as well as the choice of past tense morpheme. A discrepancy between the vowel quantity and either spelling or the English pronunciation may have been the cause of some of the deviating combinations of the pronunciation of the infinitive and the choice of past tense morpheme.

There were some limitations to the experiment. For instance, in the experiment the participants were asked to write down the past tense based on their own intuition about which past tense morpheme to choose. Therefore it may have been the case that participants wrote down a different morpheme than the one they would have used in their own spontaneous speech. Recall, though, that this methodology was chosen for the reason, namely that for all of the past tense morphemes a clear choice was made. Also, since the verbs were presented in

writing, the spelling may have influenced the pronunciation as well as the choice of past tense morpheme. Had the verbs been presented as a sound file, however, the pronunciation in this sound file would have influenced the choice of past tense morpheme.

Further research on this topic could include looking at how a group of subjects would pronounce the past tense for these loan verbs in a speech experiment. Also, it could be interesting to take a closer look at the influence of spelling by doing an experiment using nonsense verbs with groups of verbs with the same vowel characteristics and a different spelling pattern.

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Appendixes

Appendix 1 – List of sentences presented to the participants

Appendix 2 – List of verbs used in the experiment.

Appendix 3 – Complete overview of pronunciation and choice of past tense morpheme for each item and subject.

Appendix 1 – List of sentences presented to the participants

Part 1 – sentences to pronounce

Instructie (Instructions).

Lees per zin de zin eerst even rustig door. (Read the sentence silently to yourself)

Lees de zin daarna rustig in één tempo voor. (Read the sentence out loud easily)

- Werkgevers leasen soms een auto voor hun werknemers.
- Goede hiphoppers kunnen vaak heel snel bewegen, maar ook heel goed freezezen.
- Sommige mensen doen er alles aan om anderen te pleasen.
- In de gymles mogen vaak een paar kinderen een team kiezen.
- Door alle pollen in de lucht moest zij de hele dag nieszen.
- Gabbers housen graag op *feesten*.
- Door het internet te browsen kun je veel interessante informatie vinden om te *lezen*.
- Samen met mijn vader ben ik de muur *effen* blauw gaan sauzen.
- De zuster kwam langs met de steunkousen om mijn oma te kousen.
- Als de zon schijnt kun je lekker cruisen met je cabrio.
- Veel mensen gaan als de wekker gaat eerst nog even snoozen.
- Het produceren van een film kost veel tijd en geld.
- Hij lag lekker in de zon te soezen.
- Mijn zus was met haar dochter de *zeven* appels aan het moesen.
- In de kroeg kun je heerlijk socializen met je vrienden.
- Deze auto kun je naar smaak laten customizen.
- Om af te vallen moet je veel exercisen.
- Grote merken gebruiken vaak bushokjes om te advertisen.
- De boeren waren het maisveld aan het maizen.
- Voor een Thais feest waren de meiden zichzelf aan het thaisen.
- Sponsors zoeken is een belangrijk onderdeel van fundraisen.

- Als je mobiel gestolen wordt kan je deze soms tracen.
- Veel mensen vinden het heerlijk om in de vakantie een boek te lezen.
- De chirurg was de prothese aan het prothesen.
- Sommige bellen rinkelen, anderen buzzen.
- Sommige vaders quizen aan tafel hun kinderen over hun huiswerk.
- Vrouwen fitnesssen vaak voor de lijn.
- Na de plechtigheid mocht het bruidspaar elkaar kussen.
- Heerlijk knus zaten zij op de bank te knuzzen.
- Ouders die op reis zijn missen hun kinderen soms erg.
- In Mexico kun je heerlijk surfen op de grote golven.
- Veel mensen durven niet te bungeejumpen.
- Kooksmurf was bezig om een *bessentaart* te smurfen.
- Op de meeste golfbanen mogen alleen de leden golfen.
- Op veel werkplekken is er een speciale ruimte waar vrouwen kunnen kolven.
- De wolf was hard aan het huilen om de rest van de roedel te wolfen.
- De assistent kwam langs om de directeur te briefen over de gebeurtenissen.
- Het verliefde stelletje zat buiten op een bankje te liefen.
- De inbrekers waren flink aan het dieven in het huis van de rijke man.
- Veel mensen hebben de droom om eens te gaan skydiven.
- Kleine kinderen vinden het vaak leuk om te highfiven.
- We moesten de slagroom *zestig* minuten laten opstijven.
- Je moet nooit vergeten om je documenten tussendoor te saven.
- Van de schrik stonden ze te beven en te trillen.
- Toen de oude man in de weg stond vroeg de tiener hem om te moven.
- Een stel rockers was aan het shaken en grooven.
- In veel supermarkten kun je op zaterdag lekkere hapjes proeven.
- Veel studenten reizen elke dag op en neer naar de universiteit.

- Advocaten weten vaak goed hoe ze zaken moeten eisen van de tegenpartij.
- De man werd wakker van het buurmeisje dat aan het krijsen was.
- Het is onbeleefd om te wijzen naar mensen.

Part 2 – filling in the past tense

Instructie: Vul in onderstaande zinnen de verleden tijd in van het werkwoord dat tussen haakjes staat. Doe dit door een keuze te maken tussen een 'de' of een 'te'-uitgang, ook in de gevallen waarin je denkt dat er eigenlijk een andere, onregelmatige verleden tijd bestaat van het werkwoord.

Spreek voor jezelf de verleden tijd uit en schrijf deze daarna op. 'T kofschip hoeft hierbij niet gebruikt te worden.

Instructions

Fill in the past tense of the verb between brackets. Do this by making a choice between a 'de' or a 'te'-suffix, also for the verbs where you think a different, irregular, past tense exists. Pronounce the past tense to yourself and write it down afterwards. The rules of 't kofship' do not have to be used.

Voorbeeldzin

Vannacht werd ik wakker omdat ik uit mijn bed (vallen).

Vannacht werd ik wakker omdat ik uit mijn bed *valde* (vallen)

Tot vorige jaar(leasen) hij een auto. Nu heeft hij er één gekocht

Nadat de breakdancer op zijn hoofd was gaan staan(freezen) hij.

Dat hij voor haar had gekookt,(pleasen) haar.

Vanmorgen in de supermarkt(kiezen) haar zoontje de koekjes.

Zojuist(niesen) de oude man heel hard.

Gisteren(housen) de gabber in de keet

Vorige week(browsen) ik op het internet om antwoorden te vinden.

Samen met zijn dochter(sauzen) hij vorige week de muren van zijn huis.

De verpleegster(kousen) gisteravond de steunkousen van de vrouw uit.

Een uur geleden(cruisen) ik met mijn vrouw door de weilanden

Vanmorgen(snoozen) ik meer dan een half uur

Vroeger(producen) hij samen met zijn broer films.

Afgelopen zondag(soezen) zij samen in de zon.

Toen de appels vorig jaar rijp waren,(moesen) zij ze.
 Afgelopen vrijdag(socializen) ik op een verjaardag.
 De dealer(customizen) de auto naar mijn smaak voordat ik hem kreeg.
 Om af te vallen(exercisen) hij veel afgelopen winter.
 Kruidvat(advertisen) vorig jaar met 'steeds verassend, altijd voordelig'.
 Gisteren(maizen) de boeren met z'n allen het maisveld.
 De tienermeiden die naar een Thais feest gingen(thaisen) zichzelf.
 Vroeger(fundraisen) hij in zijn vrije tijd veel voor het Rode Kruis.
 Gisteren(tracen) de politie de mobiel die ik verloren had.
 Vorig jaar winter(lezen) ik vaak lekker een boek bij de kachel.
 De chirurg..... (prothesen) vanmorgen de prothese bij de patiënt.
 De zoemer(buzzen) toen ik op de bel drukte.
 Tot vorig jaar(quizzzen) Robert de deelnemers van Weekend Millionaire.
 Afgelopen maand(fitnesssen) ik zoveel dat ik 3 kilo ben afgevallen.
 Na de plechtigheid(kussen) het bruidspaar elkaar.
 Het kleine meisje(knuzzzen) heerlijk knus met haar knuffel op de bank.
 Op vakantie(missen) de zakenman de drukte op zijn werk niet.
 Op het strand zag ik een hele knappe jongen. Hij(surfen) heen en weer.
 Brilsmurf(smurfen) laatst een mooi apparaat.
 Omdat hij bang was(durven) hij niet de hond uit te laten.
 Vorige week(golfen) de dokter met zijn collega's.
 Na de zwangerschap(kolven) zij als ze op haar werk was.
 Toen het nacht werd(wolfen) de leider van de roedel de groep bij elkaar.
 Vanmorgen(briefen) de assistent zijn leidinggevende over de situatie.
 Gistermiddag(liefen) het verliefde stelletje in het park.
 Vannacht(dieven) de inbreker een hoop spullen uit het grote huis.
 Vorig jaar(skydiven) zij op haar reis door Thailand.
 Daarnet(highfiven) ik met mijn broertje, omdat we gewonnen hadden.

Terwijl de slagroom in de koelkast(opstijven), maakte ze de taart af.

Vroeger(saven) ik mijn documenten met de hand. Nu is dat geautomatiseerd.

Terwijl de oude vrouw het drinken inschonk,(beven) haar hand flink.

Gisteren in de disco zag ik een hele knappe jongen die heel leuk(moven).

De rocker die ik zaterdagavond zag spelen(grooven) enorm.

Hij(proeven) de hapjes die zijn vader had klaargemaakt.

Het meisje(reizen) vorig jaar elke dag op en neer.

Vorige maand(eisen) de advocaat een schadevergoeding.

Vannacht(krijzen) het meisje alle burens wakker.

Toen zij een bekende zag,(wijzen) ze hem aan.

Appendix 2 – List of verbs used in the experiment

item	pronunciation
buzzen	bʌz
kussen	kʌz
knuzzen	knʌz
socializen	soʊʃəlaɪz
customizen	kʌstəmaɪz
exercisen	eksəsaɪz
advertisen	ædvətaɪz
maizen	<i>majs</i>
Thaisen	<i>tajs</i>
boeklezen	lez
fundraisen	fʌndreɪz
prothesen	<i>protez</i>
tracen	treɪs
reizen	rɛɪz
wijzen	wɛɪz
krijzen	krɛɪs
eisen	ɛɪs
quizzen	kwɪz
fitnessen	fɪtnəs
missen	mɪs
leasen	li:s
freezen	fri:z
pleasen	pli:z
kiezen	kiz
niesen	nis
housen	haʊs/haʊz
browsen	braʊz
sauzen	saʊz
kousen	kaʊs
cruisen	kru:z
snoozen	snu:z
producen	prədju:s
soezen	suz
moesen	<i>mus</i>

item	pronunciation
surfen	sɜ:f
durven	dʌrv
smurfen	smʌrf
skydiven	skɑɪdaɪv
opstijven	ɒpstɛɪv
highfiven	haɪ faɪv
saven	seɪv
beven	bev
briefen	bri:f
liefen	<i>lif</i>
dieven	<i>div</i>
golfen	gɒlf
kolven	kɒlv
wolfen	wɒlf
moven	mu:v
grooven	gru:v
proeven	pruv

	70	70	71	71	72	72	73	73	74	74	75	75	76	76	78	78	79	79	80	80				
buzzen1	z	de	z	de	z	de	z	de	s	te	s	te	z	de	z	de	de	z	de					
kussen1	s	te	s	te	s	te	s	te	s	te	s	te	s	te	s	te	s	de	s	te				
knuzzen1	z	de	s	de	s	de	s	te	s	te	s	de	te	s	de	s	de	s	de	z	de			
socializen1	z	de	z	de	de	de	de	z	de	z	de	z	de	z	de	z	de	z	de	z	de			
customizen1	z	de	z	de	z	de	z	de	z	de	z	de	z	de	z	de	z	de	z	de	z	de		
exercisen1	z	de	z	de	z	de	z	te	z	de	z	de	z	de	te	z	te	z	te	z	de			
advertisen1	z	de	de	z	de	z	te	z	de	z	de	z	de	z	de	z	te	s	de	de				
maizen1	de	z	de	z	de	z	de	s	de	s	de	z	de	z	de	z	de	z	de	z	de			
taisen1	s	de	s	te	s	te	s	te	s	de	s	te	s	de	s	de	s	te	s	te	s	te		
boeklezen1	de	z	te	z	de	z	de	z	de	z	de	z	de	z	de	z	de	z	te	z	de			
fundraisen1	z	de	s	de	z	de	de	z	de	s	te	z	de	z	de	z	de	z	de	s	de			
prothesen1	z	de	z	te	s	de	z	te	s	te	z	de	z	de	z	te	z	te	z	te	z	de		
tracen1	s	te	s	de	s	te	s	de	s	te	s	te	s	de	s	de	s	te	s	de	s	de		
reizen1	z	de	z	de	z	te	z	de	z	te	z	de	de	z	de	z	de	z	de	z	de			
wijzen1	z	de	z	te	z	de	z	de	s	de	z	de	z	de	z	de	z	de	z	de	z	de		
krijzen1	s	te	s	te	s	te	z	te	s	te	s	te	s	te	s	te	s	te	s	te	s	te		
eisen	s	te	te	s	te	s	te	s	te	te	s	te	z	te	s	te	s	te	s	te	s	te		
quizen1	de	de	s	de	s	de	s	de	s	de	s	te	s	de	z	te	s	de	de	de				
fitnessen1	s	te	s	te	te	s	te	s	te	te	s	te	s	te	s	te	s	te	s	te	z	de		
missen1	s	te	s	te	s	te	s	te	s	te	s	te	s	te	s	te	te	s	te	s	te	s	te	
leasen1	de	s	de	de	s	de	z	te	z	te	z	de	z	te	z	te	z	te	s	de	s	de		
freezen1	s	de	z	de	z	de	z	de	z	de	z	de	de	z	te	te	z	de	z	de	z	de		
pleasen1	z	de	z	de	z	de	z	de	z	te	s	de	z	de	de	s	te	s	de	s	de	s	de	
kiezen1	z	te	te	z	te	s	te	z	te	z	de	z	de	z	te	z	de	z	de	z	de	z	de	
niesen1	de	s	te	s	te	s	te	s	te	s	te	s	te	z	de	s	te	s	te	s	te	s	te	
housen1	s	te	s	de	te	z	de	s	te	s	te	s	de	s	de	s	de	z	de	z	de	z	de	
browseen1	z	de	de	te	de	s	de	te	z	te	s	de	z	te	s	de	z	de	s	de	s	de		
sauzen1	z	de	z	de	z	de	z	de	z	de	z	de	z	de	z	de	z	de	z	de	z	de		
kousen1	s	de	s	te	s	te	s	de	s	te	s	te	s	te	s	te	s	te	z	de	z	te		
cruisen1	z	de	de	z	te	s	de	z	te	s	te	s	te	s	te	z	de	s	te	z	de	z	de	
snoozen1	z	de	z	de	z	de	z	de	z	de	z	de	z	de	de	z	de	z	de	z	de	z	de	
produceren1	s	te	de	s	te	s	de	s	te	s	te	de	s	te	z	te	de	s	te	z	te	de		
soezen1	z	de	z	de	z	de	z	de	z	te	z	de	z	de	z	de	z	te	de	s	te	z	de	
moesen1	s	de	s	de	s	te	s	te	s	te	te	z	te	s	de	z	te	te	s	de	z	te	te	
surfen1	f	te	f	de	v	de	v	de	v	de	f	de	de	f	de	f	te	f	te	f	de	f	de	
durven1	v	de	de	v	de	v	de	v	te	v	de	v	de	v	de	v	de	v	de	v	de	de	de	
smurfen1	f	de	f	te	de	v	de	f	te	v	de	v	de	f	de	v	te	v	te	v	te	v	te	
skydiven1	v	de	v	de	de	de	v	te	v	de	de	de	de	v	te	v	te	v	te	v	te	v	te	
opstijven1	v	de	v	de	v	de	v	de	v	te	v	de	v	de	v	de	v	de	v	de	v	de	v	de
highfiven1	v	de	v	de	v	de	de	v	te	v	de	v	de	v	de	v	de	v	de	v	de	v	de	
saven1	v	de	v	de	v	de	de	v	te	v	de	de	v	de	v	te	v	de	v	te	v	de	v	de
beven1	de	v	de	v	de	v	de	v	te	v	de	v	de	v	de	v	de	v	de	v	de	v	de	
briefen1	f	de	f	de	f	te	de	f	te	de	f	de	f	de	f	de	v	te	f	de	f	de	f	de
liefen1	f	de	f	te	f	de	f	de	f	de	f	de	f	de	v	de	f	de	f	de	f	de	f	de
dieven1	v	de	v	de	f	de	de	f	de	f	de	de	v	te	f	de	f	de	de	f	de	de	de	
golffen	de	te	v	de	f	de	f	te	de	v	de	v	de	v	de	f	te	f	de	f	de	f	de	
kolven1	v	de	v	de	v	de	f	de	v	te	v	de	v	de	v	de	v	de	v	de	f	de	f	de
wolfen1	f	de	f	te	f	de	f	de	v	de	te	v	de	f	de	v	de	v	de	v	de	v	de	
moven1	v	de	v	de	v	de	v	de	te	de	v	de	v	de	v	de	v	de	v	de	v	de	v	de
grooven1	v	de	v	de	v	de	v	de	te	de	v	de	de	v	de	de	v	de	v	de	v	de	v	de
proeven1	v	de	de	v	de	v	de	v	te	v	de	v	de	v	de	v	de	v	te	v	de	v	de	