

BET BIG OR PET PIG?:
The Influence of the Finnish Phonetics on Finnish Speakers’
Pronunciation of English

Bachelor’s Thesis
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<p>Tämän kvalitatiivisen tutkielman tarkoituksena oli selvittää ja kuvata erilaisia tapoja, joilla suomen kielen fonologinen ja foneettinen järjestelmä voivat vaikuttaa suomalaisten oppijoiden englannin klusiilikonsonanttien ääntämiseen. Tutkimuksessa analysoitiin kieltenvälistä siirtovaikutusta eli transferia, tutkittiin suomen ja englannin kielten fonologisia ja foneettisia järjestelmiä ja niiden eroja, sekä etsittiin konkreettisia esimerkkejä suomen siirtovaikutuksesta englannin ääntämiseen. Siirtovaikutusta on tutkittu paljon, mutta suomen ja englannin suhde, etenkin ääntämisen kannalta, vaatii lisätutkimusta.</p> <p>Tässä tutkielmassa analysoidut äänteet jaettiin neljään ryhmään niiden oikeaoppisuuden mukaan, ja niitä tutkittiin ääniaaltokuvien ja erilaisten käyrien avulla, sekä kuuntelemalla. Tutkielman aineisto kerättiin kahdelta osallistujalta. Osallistujat suorittivat tätä tarkoitusta varten laaditun ääntämistestin, ja suoritus nauhoitettiin analysointia varten. Aineistosta löytyi kattavasti erityyppisiä esimerkkejä jokaiseen ryhmään.</p> <p>Kyseessä oli kvalitatiivinen tapaustutkimus, joten tuloksista ei voida tehdä yleistettäviä johtopäätöksiä. Kuitenkin tutkielman tulokset kuvailevat erityyppisiä virheitä kattavasti, ja niitä voidaan hyödyntää esimerkiksi ääntämisen opettamisessa.</p> <p>Tutkimusta aiheesta voidaan jatkaa esimerkiksi erityyppisten äänteiden, kuten frikatiivien, sekä ääntämisen eri osa-alueiden, kuten painotuksen ja intonaation, näkökulmasta. Lisäksi laajempi joukko osallistujia tarjoaa mahdollisuuden vertailla esimerkiksi eri ikäryhmien tai ammattien edustajien ääntämistä, ja kvantitatiivisella tutkimuksella saadaan yleistettäviä tuloksia.</p>	
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1 INTRODUCTION

In the globalized world of today English serves as a lingua franca in the fields of politics, media, education and travel, among others, and is used in international operation of various organizations (Crystal 2003: 86-113). The status of English as a means of communication is becoming more important also in Finland. According to Virkkula (2008: 382) the working life in Finland has changed extensively, one of the largest changes being globalization which has brought many challenges. Many Finnish companies have become multinational, and it is often assumed that the employees are in possession of basic knowledge of English.

Nowadays in most international political gatherings the first choice for a lingua franca is English (Crystal 2003: 86-87). Another area clearly dominated by the English language is media, e.g. international newspapers, film industry, and popular music (Ibid.: 93-102). English is also used as a lingua franca in such areas as science and technology, and, as Crystal (2003: 110-111) states, it is easier for a person to be in contact with the latest thinking and research by learning English than any other language.

Virkkula (2008: 414) analyses in her article five master's theses, according to which English has an important role in international business, and many Finns working for these companies have to use English almost daily. Language skills are nowadays thought to be a part of the employees' general professional skills. By and large it seems that in the future English is needed more and more in the Finnish working field. (Ibid.: 417).

Being clear that it is becoming the norm to know foreign languages, at least English, one can state that people who are proficient in more than one language are needed in many lines of business. Therefore, it is very important to concentrate also on teaching pronunciation, and understanding the major differences between the phonetics and phonological systems of native and foreign languages gives great benefit to it.

'Language transfer', or 'cross-linguistic influence', either positive or negative, is an important aspect of second language learning, especially with spoken language. As Odlin (1993: 112) states, it is very likely that the phonetics and phonology of native language have a strong influence on second language pronunciation. Finnish and English are in various ways very different languages, also phonetically and phonologically, and therefore the transfer effects both in receptive and productive skills of Finnish learners are inevitable. In this paper I will focus on the negative side, i.e. interference, of one language to another.

By analyzing errors it is possible to find problems in pronunciation typical to Finnish learners, and these findings can be used to improve teaching. The phenomenon of language

transfer has been widely researched during the past decades, but the relation of Finnish as the native language and English as a second language, especially in the field of phonetics and phonology, needs more examination.

The purpose of the present study was to examine the spoken English of native speakers of Finnish, and identify elements or errors that can be explained as interference of the Finnish phonetics and phonological system. I concentrated on productive skills and spoken language due to the scope of the study; receptive skills and comprehension are also an important part of language learning and language transfer, but since this was a bachelor's thesis, one narrower area had to be chosen. The study concentrated on plosive consonants (=stop consonants) as it is an area of phonetics that covers some major differences between the phonological systems of Finnish and English. As Suomi et al. (2006: 159) point out, the Finnish plosives, /p/, /t/ and /k/, are generally unvoiced and unaspirated, whereas in English, according to Ladefoged (2005: 56-59), voicing and aspiration have a very important role in distinguishing sounds. Differences in voicing and aspiration between Finnish and English plosives were therefore the main approach in this study.

Finnish phonetic/phonological system does not originally have voiced plosives, except /d/ in some word-medial positions, e.g. *'äidin'* /æidin/ – *'mother's'*. However, in newer loan-words there are also voiced plosives, such as *'baari'* /ba:ri/ – *'a bar'*. According to Ladefoged (2005: 58), voicing in a plosive in English has also an effect on the length of the vowel preceding it (compare *'mat'* and *'mad'*), and it is worth examining whether Finnish speakers are able to make the distinction when producing the language. Another aspect in analyzing plosives is the use of aspiration. Finnish words do not have aspiration on stressed phonemes, whereas in English it is a very significant element of voiceless plosives in order to distinguish them from voiced plosives, for example in the minimal pair *'pull'* /p^hul:/ and *'bull'* /bul:/.

The data used for this research contains spoken samples from two participants. The participants took a pronunciation test, i.e. they read out loud one longer piece of text, some word pairs, a few short sentences, and also individual words in the same frame sentence. The test was produced for this purpose only in order to get a sufficient number of analyzable examples of plosive sounds.

'Phonetic system' as a term, meaning the actual realizations of sounds in the language, is used in this study in order to distinguish it from 'phonological system', meaning the theoretical sound system. The phonetic realizations of the sounds usually differ from the phonological standard, also in Finnish, and therefore the distinction is important. This will be explained further in section 2.3. Hence the transcriptions of certain sounds or examples in this study are

within square brackets (e.g. [p]) or slashes (e.g. /p/). As it is usual in phonetic and phonological transcription, the square brackets represent the concrete phonetic realization of the sound or word, and the slashes characterize the pronunciation according to the phonological standards of the language.

At first, in section 2.1, the phenomenon of language transfer will be explained concentrating on the phonological and phonetic side of it. In order to find out what issues in English phonology and phonetics may cause problems for Finnish speakers I will then describe the phonological systems of English and Finnish and the major differences between them in sections 2.2 and 2.3. After that, in section 2.4, I will briefly review a study (Suomi 1980) about voicing in plosive consonants and summarize the main findings. Then I am going to report on this present study more thoroughly in chapters 3 and 4 and discuss the study and the findings further in chapter 5.

2 TRANSFER AND PHONETICS

2.1 Phonological transfer

According to Jarvis & Pavlenko (2008: 1), language transfer can be described as “the influence of a person’s knowledge of one language on that person’s knowledge or use of another language”. The terminology behind the phenomenon has caused some disagreement; the term ‘transfer’ has been said to associate with the behaviorist view of skill transfer. Other terms have also been used, such as ‘interference’, but since it has rather negative connotations, ‘cross-linguistic influence’ is often preferred; it includes a variety of different ways that knowledge of one language can affect the other. (Jarvis & Pavlenko 2008: 1-3). In the present paper all these terms will be used varyingly and almost as synonyms, but ‘language transfer’ or ‘influence’ are more frequent.

Phonological transfer means the ways in which the knowledge of the phonological system of a language affects a person’s ability to recognize and produce the sounds of a different language (Ibid.: 63). In this paper I will concentrate on production. Odlin (1993: 113) reminds that languages have different phonetic systems, and that even sounds that may seem similar can differ significantly when comparing their acoustics. Learners can modify their pronunciation closer to the target language, but it often leads to approximations that are not completely similar to the target language or their native language (Ibid.).

For many speakers it can be difficult to distinguish and also produce sounds very different from their native language (Ibid.: 114-115). Based on this fact one can make the assump-

tion that distinguishing and producing, for example, the dental fricatives of English may cause problems to Finns since Finnish lacks them completely. According to Jarvis & Pavlenko (2008: 64), many difficult sounds of the target language are often substituted by fairly similar sounds from the native language; the native language determines which sounds will be used and in which contexts. Moulton (1962, as cited in Odlin 1993: 115-117) classifies segmental errors into four groups; 1: phonemic (=phonological) errors (which happen when the sound systems of the two languages differ, e.g. as it was mentioned above, the Finnish sound system does not have dental fricatives /ð/ and /θ/, which may cause problems when learning English), 2: phonetic errors (the languages have phonologically similar sounds which yet realize phonetically differently, e.g. /ɹ/ is in most variants of English an approximant and the rather similar /r/ in Finnish is a trill), 3: allophonic errors (a certain realization of a sound in native language is not always a suitable realization of a similar phoneme in target language, e.g. the flap sound [ɾ] used instead of /t/ in American English (described more thoroughly in section 2.2) would not be suitable in Finnish words) and 4: distributional errors (the differing phonotactics of the native and target language cause errors, e.g. word-initial consonant clusters that are not originally a part of the Finnish phonotactics can be difficult to pronounce for Finns). In addition, language transfer can be seen in issues such as stress, tone and rhythm in spoken language (Odlin 1993: 117), but these will not be examined further in this paper.

Although Odlin (1993) and Jarvis & Pavlenko (2008) talk about ‘phonological transfer’, I believe it would be more useful to use the term ‘phonetic transfer’ in this case; it is true that the phonological system of a language affects the proficiency in other languages, but when observing the actual language that learners use (whether it is their native or foreign language) and examining concrete examples of their pronunciation one has to approach them from the phonetic point of view. After all, the actual phonetic realizations of the sounds are the subject of the research.

2.2 Plosives in the English language

As Ladefoged (2005: 13) describes, in the articulation of plosives, or stop consonants, there is a complete closure in the articulators so that the stream of air is occluded from escaping through the mouth. Also the nasal tract is blocked so that the air cannot stream out from there either. The pressure of air in the mouth will then be released with a burst of sound. The closure can be formed e.g. by lips (a bilabial plosive, /p/ and /b/), tongue and alveolar ridge (alveolar plosive /t/ and /d/), or by tongue and velum (velar plosive /k/ and /g/). (Ibid.)

Consonants can be divided into two groups according to how the vocal folds act during the articulation: voiced and voiceless. Voiced sounds occur when the vocal folds vibrate while making a specific sound, for example /v/ and /g/. In voiceless sounds the airstream from the lungs flows through the pharynx without the vocal folds vibrating, for example /f/ and /k/. The voiced plosives in English are /b/, /d/ and /g/, and the voiceless are /p/, /t/ and /k/. (Ladefoged 2005: 3).

Some English dialects include also a glottal plosive sound which occurs when the airstream is stopped by the vocal folds which are held together, and it seems like there actually is not a sound at all. Usually the glottal stop occurs as an allophone of /t/ (in words such as ‘*beaten*’ [bɪ:ʔn] and ‘*butter*’ [bʌʔə]), and it is transcribed with [ʔ]. Another exception to the /ptk/ - /bdg/ distinction is the /t/ sound changing to a voiced quick flap (marked with [ɾ]) with many speakers of American English. This change happens when /t/ occurs between a stressed vowel and an unstressed syllable other than /n/ in words such as ‘*city*’ /sɪti/ and ‘*little*’ /lɪtl/, which realize as [sɪɾi] and [lɪɾl]. (Ibid.: 60-61).

Voicing plays an important role in distinguishing different sounds in English. However, it is not only the voicing that really differentiates the /ptk/ sounds from /bdg/. According to Ladefoged (2005: 56), with most people there is very little voicing happening in the pronunciation of words like ‘*buy*’ when the lips are closed and the airstream is completely stopped. To make the distinction between ‘*buy*’ and ‘*pie*’, there is a moment of aspiration, a voiceless burst of air, after the articulation of the voiceless plosive sound /p/, which is marked with a small raised h – [p^h]. Whether the voiced sound actually realizes as a voiced sound depends on its context in the word or sentence. In a word-medial position with a voiced sound on either side it is usually voiced. Sentence-initially or after a voiceless sound the voiced plosives usually realize with no voicing (for example /b/ in ‘*that boy*’). Aspiration has therefore even greater role in distinguishing voiced and voiceless plosives. (Ladefoged 2005: 56).

Voicing also affects the length of the vowel preceding it, as in words such as ‘*nag*’ (compared to ‘*knack*’) and ‘*bag*’ (compared to ‘*back*’). In a word-final position a voiced plosive has actually little voicing, and the lengthened vowel helps distinguishing such minimal pairs as the ones above. (Ladefoged 2005: 58).

2.3 Plosives in the Finnish language

As it was mentioned in chapter 1, I use the term phonetic system in this study to refer to the ways different sounds realize in the language, and that the realizations usually differ from the

phonological standard of the language, which is the case also in Finnish. This will be explained in greater detail in this section.

Suomi et al. (2006: 156) present a division of the Finnish consonants into five different groups depending on how they appear in the different variations of the Finnish language (see Figure 1); consonants in group 1 appear in all the variations, the ones in group 5 only in a few and the rest fall between. Usually if a variation includes consonants from, for example, group 5 also the groups with lower numbers appear in it. So based on this division one can state that also consonant sounds such as *b*, *g*, and *ʃ* are a part of the Finnish phonological system, although they might not appear in all the phonetic variations of the Finnish language.

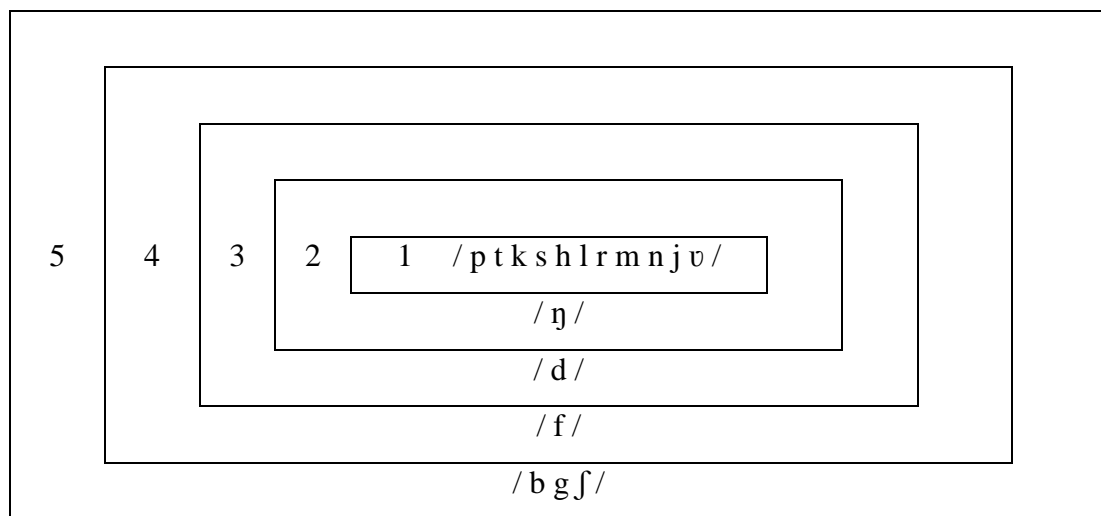


Figure 1. The division of the Finnish consonants depending on how they appear in the different variations of the Finnish language. (Suomi et al. 2006: 158)

The Finnish consonants have at least two allophones each, rounded and unrounded, depending on whether they are surrounded by rounded ([y], [u], [ø] and [o]) or unrounded ([a], [e], [i] and [æ]) vowels (Ibid., pp. 157-158). However, this issue will not be discussed any further here since every consonant has the similar allophones and it can be predicted by looking at the surrounding vowels. Instead we can take a closer look at the plosive sounds, found in groups 1, 3 and 5, and their possible allophones other than rounded and unrounded.

Group 1 – /p/, /t/ and /k/

According to Suomi et al. (2006: 159) the Finnish plosives /p/, /t/ and /k/ are mainly voiceless and unaspirated, which means that in careful pronunciation they do not realize as [b], [d] and [g] or [p^h], [t^h] and [k^h]. However, it is possible to encounter at least the voiced realizations in

rapid and careless speech. Universally the Finnish plosives are rather usual; most of the plosives in all the languages in the world are unaspirated and voiceless.

The plosive /p/ does not have any allophones in the Finnish sound system, meaning that, excluding the roundness, the only allophone of /p/ is the bilabial [p]. Consonant /t/, on the other hand, has slight variation. Usually it is described as a voiceless dental plosive, but when examined more thoroughly, it is actually lamino-dentalveolar. This means that in addition to the apex of the tongue touching the teeth the blade of the tongue touches the alveolar ridge. Furthermore, the Finnish /t/ has also a laminoalveolar allophone that is articulated further back in the mouth, and the tongue does not touch the teeth. This kind of allophone appears with /l/, /s/ and /r/ sounds when the [t] assimilates to their position of articulation (apicoalveolar) in combinations such as /tl/, /ts/ and /tr/. Also the velar /k/ has different allophones, depending on the vowels surrounding it; with front vowels it is articulated slightly closer to the front of the mouth, and therefore it could be described as pre-velar. (Ibid.: 160).

Group 3 - /d/

It was mentioned in section 2.1 that sounds that seem identical in two languages may differ greatly when comparing their acoustics due to the differences between the phonetic systems (Odlin 1993: 113). This is also the case with the Finnish and English /d/ sounds. According to Suomi et al. (2006: 169) the Finnish /d/ differs slightly from the sound that the symbol /d/ represents in the IPA-chart (a voiced alveolar plosive). In fact, when examined according to its manner of articulation, it does not seem to be a plosive at all. However, the IPA-chart does not have a symbol more suitable for this situation, and therefore /d/ is commonly used to represent the Finnish sound. The Finnish /d/ is apicoalveolar, and it is relatively short; it bears a great resemblance to flap consonants. Suomi et al. (2006: 170) suggest that it could be defined as a half-plosive.

Despite being a part of the standard Finnish language, in various dialects /d/ is usually replaced by some other sound, such as [r] or [r̥] in the Southern Ostrobothnia area, [l] in the older Tavastian dialects, and in the eastern and northern dialects [j], [v], [w], [h] and [t], and sometimes it is completely omitted from the word. In original Finnish words /d/ can appear only word-medially, but in newer loanwords it can be in word-initial and -final position. (Suomi et al. 2006: 170).

Group 5 - /b/ and /g/

In section 2.1 it was stated that distinguishing and producing sounds that are different from the native language can cause problems to speakers (Odlin 1993: 114-115). The voiced plosives /b/ (bilabial) and /g/ (velar) were not originally in the Finnish sound system, but have later been borrowed to the language with fairly new loanwords (Suomi et al. 2006: 172), which is one possible issue causing interference. In some cases in Finnish /b/ and /g/ can be regarded as allophones of /p/ and /k/ if they are pronounced similarly, even though they are written with different characters; this means that the Finns have just learned to write differently words that are separate by their meaning but identical by their pronunciation, such as words ‘*pussi*’ (‘*a bag*’) and ‘*bussi*’ (‘*a bus*’) which both can realize as [pus:i]. (Ibid.: 173).

There are many speakers of Finnish who do not distinguish /p/ from /b/ and /k/ from /g/ in their speech; plosives in group 1 in Figure 1 are the only ones that can be found from all the dialects of spoken Finnish. However, there are variants in which /b/ and /g/ represent phonemes separate from /p/ and /k/. Suomi et al. (2006: 173) suggest that a possible reason for the /p/ - /b/ and /k/ - /g/ distinction could be that the speaker has learned foreign languages in which /b/ and /g/ are distinct phonemes. Other reasons could be the social background of the speaker (they might be educated, relatively young and living in urban areas), slow rate of speech, or use of an official register (i.e. the standard spoken Finnish).

2.4 Voicing in English and Finnish stops (Suomi 1980)

Suomi (1980) conducted a study concentrating on voicing in English and Finnish plosives. Three different groups of participants were examined in the study: native speakers of English, native speakers of Finnish with training in English provided by secondary school, and native speakers of Finnish with training in English required from secondary school teachers. The aim of those sections of the study that focus on English produced by native speakers of Finnish was to describe the learner language in relation to their native language and the target language. In this part of the present paper I will briefly go through the study, concentrating on the particular section about English produced by the Finnish participants.

In the study the participants read out loud simple words set in a frame sentence, both in English and Finnish. The frame sentences were ‘*Say ___ loudly.*’ in English and ‘*Joko ___ luettiin?*’ in Finnish. The Finnish words will not be discussed further since I will focus on presenting the findings about the English language of the Finnish participants. The words in English were mono- or disyllabic words that had plosive consonants in word-initial, -medial

and -final position, and there were 206 different words in total. The words were of simple structure and the Finnish participants knew how to pronounce them correctly.

2.4.1 Findings

Plosives in word-initial and word-medial position.

With a few exceptions the /ptk/ sounds in English realized mainly as voiceless aspirated or voiceless unaspirated, and the /bdg/ sounds as voiceless unaspirated, moderately voiced, and extensively voiced. There were a few instances where /ptk/ realized as voiced and /bdg/ as voiceless aspirated, which was not found with the English informants since it is definitely not part of the norm of the English pronunciation. However, it is impossible to say whether these kinds of errors are due to learners' internalized rules of the pronunciation of English.

Suomi (1980: 140) concludes that the relatively large number of voiceless unaspirated realizations could be explained by native language interference or by the fact that they are phonetically simpler than fully voiced or aspirated sounds. It is also possible that the interference and the universal simplicity emphasize each other. It must be remembered that it is the native language that determines which sounds are easier and which more difficult for us to pronounce.

Plosives in word-final position

The categorization of word-final plosives to voiced and voiceless sounds could not be done in the study "because of the large number of missing observations, for most of the informants, of VOT*". In other words, they did not provide an analyzable sample of the sound, which was also, however, the case with two of the five English participants. This may be due to the fact that the release of word-final plosives has not been functionally significant in English compared to the duration of the vowels preceding them. There was also variation in the amount of voicing with word-final /bdg/ sounds. Therefore it is more important to concentrate on the duration of the preceding vowel. (Suomi 1980).

Seven of the ten Finnish informants showed no distinction between the effects of /ptk/ and /bdg/ on the duration of the preceding vowel. It was found that although in Finnish the quantity (i.e. duration) of vowels has a distinctive function, Finns are not able to distinguish durational differences that have a linguistic function other than the function of the vowel duration in their mother tongue.

*voice onset time

2.4.2 Summary

With some exceptions the sounds in the samples of Finnish participants realized similarly to the English participants. The findings of the analysis are divided into four groups:

- (1) learners use a correct target language rule,
 - (2) learners use a rule that is faulty in terms of the target language but bears an obvious resemblance to and is readily identifiable as an attempt at the correct target language rule,
 - (3) learners obviously lack a target language rule, and
 - (4) learners are in possession of a rule that is definitely not used by native speakers.
- (Suomi 1980: 151)

It is possible to make further classifications in each case about whether a similar rule can or cannot be found in the native language of the learners. If there is an equivalent rule in the mother tongue, it is usual to make the assumption that the occurrence of a rule that cannot be found in the target language is caused by language transfer (Suomi 1980: 152). Respectively, if there are identical rules in both the languages it is not possible to assess whether the correct use of those rules in the learners' language is the outcome of positive transfer or simply learning.

As an example of learners' correct use of target language rules (group 1), Suomi (1980: 152) explains how the Finnish participants produced variation in the duration of occlusion of the airstream in /ptk/ and /bdg/ sounds regarding the phonotactic position of the sound, although similar variation does not occur in the Finnish /ptk/ sounds. As for the second group, there were instances where some of the participants displayed extensive overlapping of the voiceless and voiced stops. A few examples are given of the third group; some participants did not apply the rule of lengthening the vowel before word-final /bdg/ plosives. Possible reasons for this are that the participants are simply ignorant of such rule, they might lack the ability to distinguish durational patterns of a foreign language, or it could stem from "transfer of training", meaning that the model of pronunciation provided by their native Finnish teachers may have been incorrect. The fourth group is explained as "systematic slips of the tongue", which stem from neither the target language nor the native language. Instead they seem to result from the universal tendencies related to the general anatomy of the human vocal apparatus and the ease of articulation.

2.4.3 Evaluation

The most significant issue with analyzing the findings of this study is that rather long time has passed since the data was gathered in January 1978. A similar study carried out now, 35 years later, would probably show different results. As it was stated in the introductory chapter of this paper, the status of English as a lingua franca has changed dramatically during the past few decades, and this has naturally affected the way it is taught. One could presume that the oral skills of English learners in Finland have improved. Furthermore, the possibility of “transfer of training” – the teachers giving faulty input of spoken language – might not be a very significant reason for pronunciation errors today. The amount of input from elsewhere than formal teaching situations, mainly television, radio and the Internet, has increased radically; the (Finnish-speaking) English teacher at school is no longer the primary model of spoken language for young learners. Nowadays it is possible, or in fact inevitable, to receive authentic samples of spoken English everywhere.

3 THE PRESENT STUDY

The aim of this study was not to find generalizable results about language transfer; a quantitative study on this issue would have been beyond the range of a BA thesis. Instead it was a qualitative case study concentrating on one research question: What kinds of phonetic examples of cross-linguistic influence can be found from the spoken English of the participants?

As it was stated above in section 2.3 most variations of Finnish do not have voiced plosives; this idea was the main approach of this study. The analysis will focus on voicing and aspiration, and also on the effect of voicing on the preceding vowel.

The two participants of the study were native speakers of Finnish and of ages 18 and 22. The reason for choosing participants of these ages was that they had already studied English for several years, and therefore had at least some knowledge about the English sound system. There were two participants since the purpose was to find concrete examples of language transfer from the spoken samples of these participants instead of coming into generalizable conclusions about what kinds of errors Finnish learners usually make. At the time of gathering the data participant 1 was a student from a rather small upper secondary school, and participant 2 was a university student but not studying any language.

3.1 Data and methodology

In the study the participants took a pronunciation test which was recorded for analysis. The data was gathered in January 2013 by using a Roland R-09HR High-Resolution WAVE/MP3 recorder, and it was analyzed with Praat software. It was recorded in stereo and later converted to mono for analysis. The test used in this study consisted of four parts (referred to in the present study as parts 1-4 from now on): one longer text (part 1), word pairs (part 2), short sentences (part 3) and words set in a frame sentence (*'Say ___ loudly'* – the same sentence used by Suomi (1980) with the English words) (part 4). The test will be described in more detail shortly, and it is included in its entirety in Appendix 1. The participants had the chance to read through the test once before recording, and then they read it twice on tape. This made it possible to compare the two recordings of the same samples if needed, and it also provided an extra recording in case something went wrong with the first one. The test was created for this purpose only in order to have a sufficient number of plosive consonants, i.e. enough examples, for analysis. The recordings included also short discussion with the participants in Finnish about their own views on their pronunciation of English and their dialects. Furthermore, their learning history and school grades of English were covered briefly in the discussion. The participants were advised to skip difficult words or words that they did not know how to pronounce and continue with the test, but they both still tried to pronounce such words.

In part 1 of the pronunciation test there was a longer text that had both voiced and voiceless plosive consonants in word-initial, -medial and -final positions. The purpose of this longer text was to get samples of plosives in rather natural context (compared to single words or word pairs). Part 2 had word pairs, most of which were minimal pairs. In this part the participants had a chance to concentrate only to the specific words and give a more accurate pronunciation. In part 3 there were five short sentences with different types of plosives and also some minimal pairs. Part 4 consisted of single-syllable words with plosives in word initial and final position set in a frame sentence. This eliminated the possible effect of the context of the sound or word to the pronunciation. The fourth part had also some minimal pairs, and they were placed separately so that the participants would not necessarily realize their connection but they would be pronounced individually.

The surroundings were slightly different during the two recordings; the sample of participant 1 was recorded in a classroom with some background noise from the air-conditioning system. The surroundings with participant 2 were quiet, and because of that and the fact that

participant 2 had a slightly louder voice the sound peaked and distorted at some points when she read the test for the first time. However, the issue was fixed for the second recording, and there were analyzable sounds also in the first recording. In addition, there was a slight echo in the samples of the both participants which caused some confusion in the pitch curve during the analysis. Nevertheless, most of the sounds could still be easily categorized.

In the recorded samples I found various concrete examples of how the speakers' knowledge of their native language Finnish can influence their output in English. The examples had similarities with the differences found in the English and Finnish articulatory phonetics described earlier, and they are analyzed according to the four groups that Suomi (1980) used, presented in section 2.4.2.

3.2 The participants

Participant 1 was male and 18 years old at the time of the recording. He was an upper secondary school student from the Päijänne Tavastia region in Southern Finland, and he had lived there his whole life. In his dialect this could be seen e.g. as the disappearance of /d/ in such words as *'kahdeksan'* (*'eight'*) – [kaheksan], which is very common for Finnish speakers. Participant 1 stated that pronouncing English has always felt easy and that he had never had any learning difficulties. His grades in English had usually been around 7 on the Finnish grading system (4-10), meaning satisfactory. He felt that pronunciation has been taught enough in English lessons in school. He had not paid attention to his accent when speaking English, and he had not spent longer times in any English-speaking countries.

Participant 2 was 22 years old, female and originally from the Northern Ostrobothnia region but had settled to Central Finland about 2½ years before the recording. She has felt pronouncing English easy after spending almost a year working in England. She had never had any learning difficulties and the grades she received in English in school were *"tosi hyviä"* – *"really good"*. She felt that she had been taught very little pronunciation until later in upper secondary school and that she would have wanted more instruction in it. She stated that she has a British accent at least to some extent. Being originally from the Ostrobothnian dialectal region did not seem to have a strong effect on her speech, at least when considering plosives; in normal speech she usually omitted the /d/ sound, similarly to participant 1.

The native dialects of the participants did not in their own opinion have a strong effect on their pronunciation of English, and neither was it clearly observable in the samples. It is difficult to say, with this knowledge, whether some of the errors stemmed from their dialects or

the Finnish sound system in general. The effect of native dialects will therefore not be analyzed any further in this paper.

4 RESULTS

In this chapter I will present the results of this study. The samples of the participants will be analyzed according to the four groups of categorization used by Suomi (1980), which were described earlier in section 2.4.2. In addition, I will report on the participants' own views on their pronunciation and the test as a whole. Finally, I will discuss the results and also evaluate the present study overall.

On the whole the samples of the participants included various kinds of examples from each of the groups in Suomi's categorization. It can be generalized that participant 1 tended to lose the voicing and aspiration and had more voiceless and unaspirated sounds in the samples (which can be seen as influence of the Finnish phonetic system), whereas participant 2 made a slightly stronger distinction between voiced/voiceless and aspirated/unaspirated sounds. However, with both participants there were a number of samples of correct pronunciation among voiced and voiceless, and also aspirated and unaspirated sounds. In addition, there were examples in which the participant made a correct distinction with voiced and voiceless plosives regarding the length of the preceding vowel. However, there were also interesting examples of more or less faulty pronunciation which will be covered more thoroughly later on. In general, the participants made the least errors in part 2 of the test, which probably stems from the fact that in part 2 they had the chance to pronounce the words more carefully compared to e.g. part 1 in which the sounds were in a longer text.

I will give examples of the findings analyzed in this section of the present paper and also provide images of them. For each given example there are two images, which can all be found in Appendix 2; in the upper figure there is the waveform of the sample, and the lower figure represents the intensity curve (solid line) and pitch curve (dotted line). Both of the images include the transcription of the sample below them. The intensity range in all of the images is 50.0-100.0 dB and the pitch range is 50.0-300.0 Hz. The scale in the lower figure represents the pitch; it was not possible to include also the scale of the intensity curve in the same image, so only the pitch scale was included. However, it is more important to concentrate on the curve itself and not on the exact value of it in certain points. I will not include spectrogram images of the samples since the waveform and the pitch and intensity curves provide a suffi-

cient amount of information needed for analysis and, furthermore, the images are clearer and more reader-friendly this way.

With both participants there were some issues with the pitch curve; with participant 1 the curve could not always be trusted because of the low pitch of voice (e.g. the program did not recognize the voicing although the sound was clearly voiced), and, as it was mentioned earlier, both of the recording situations had a slight echo which caused some confusion in the curve. However, this did not affect the analysis significantly, and the possible problems are mentioned in the images in which they occur.

4.1 The samples analyzed according to Suomi's classification

The spoken samples collected from the two participants will be analyzed in this section according to the classification into four groups provided by Suomi (1980) in his study. The categories of the participants' samples were as follows:

- (1) learners use a correct target language rule,
 - (2) learners use a rule that is faulty in terms of the target language but bears an obvious resemblance to and is readily identifiable as an attempt at the correct target language rule,
 - (3) learners obviously lack a target language rule, and
 - (4) learners are in possession of a rule that is definitely not used by native speakers.
- (Suomi 1980: 151)

In the following sections I will give two examples of each group, one from each participant of the present study. The examples focus on voicing and aspiration, and also on the effect of the plosive consonant on the length of the preceding vowel. In Appendix 2 there are images of the examples described in this chapter, and some smaller images of waveforms of those examples are included also in this section when relevant (Figures 2, 4, 5 and 7). I added also some extra waveform images (Figures 3 and 6) within the text for comparative purposes only. They will not be included in the Appendices section.

4.1.1 Group 1

In the participants' samples there were a great number of examples of pronunciation that can be described as correct when comparing it to the standard pronunciation of English, i.e. samples that fit in group 1 of Suomi's categorization. Criteria for a plosive sound to be included in this group is not very strict; with sounds that are supposed to be voiced according to the norms of English pronunciation I accepted also slightly voiced sounds, and with aspirated sounds also slightly aspirated sounds were included. The criteria was similar with the length

of the vowel; if the vowel preceding a voiced sound was slightly longer than a similar vowel preceding a voiceless sound it was considered correct pronunciation.

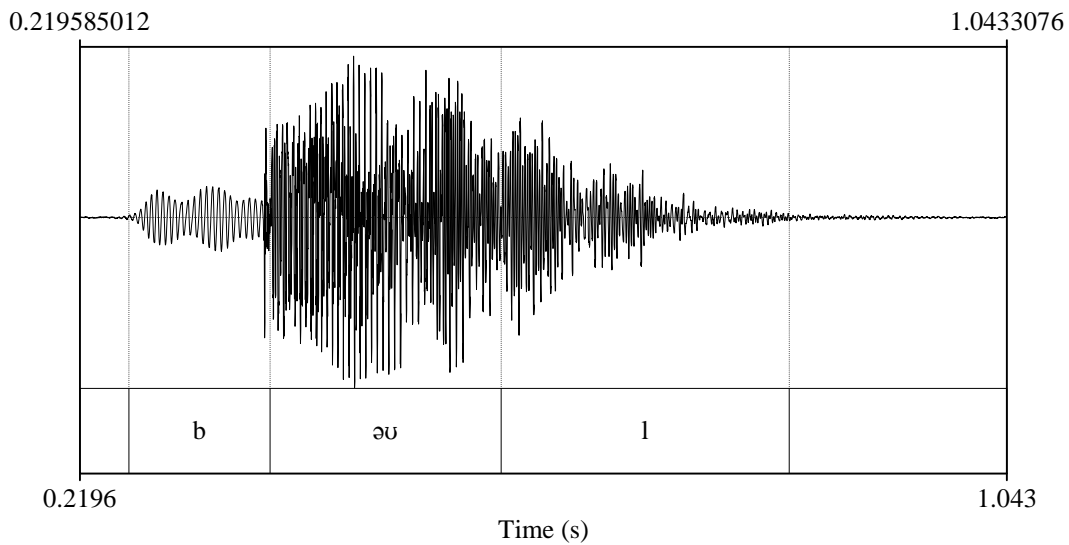


Figure 2. Waveform of 'bowl'. Participant 2, recording 1, part 2 of the pronunciation test.

One example of correct pronunciation is of the word 'bowl' (Figure 2) from the first recording of part 2 of the pronunciation test with participant 2. Although it was stated in section 2.2 that with many speakers a voiced plosive in such word-initial position as the /b/ is practically voiceless, we can see from the waveform that this sample is clearly voiced. It actually seems and sounds very similar to a nasal consonant with the exception that it ends in a noise burst, i.e. the release of the stop, right before the vowel onset. The pitch curve (Appendix 2, image 1) confirms the voicing. The strong voicing can be due to the fact that in part 2 of the pronunciation test the words were pronounced separately, so that the participant made a slightly stronger and more careful voicing than she would do in ordinary speech. When we compare the waveform to her pronunciation of /p/ in the word 'pole' (Figure 3), which is clearly aspirated, we can see that the wave looks very different. In 'pole' there is a moment of aspiration right after the noise burst at the beginning of the waveform.

Another example that fits in group 1 of Suomi's categorization is the sample of the word 'town' from the first recording of part 1 with participant 1 (Appendix 2, image 2). According to the standard pronunciation a voiceless plosive, in this case /t/, in a stressed word-initial position in a word like this is supposed to be aspirated. By examining the waveform we can see that the sound is clearly aspirated; a noise burst and a moment of aspiration are visible before the vowel onset. When we look at the lower image and compare it to the waveform we can see that the intensity curve rises with the aspiration and the voicing begins clearly after that.

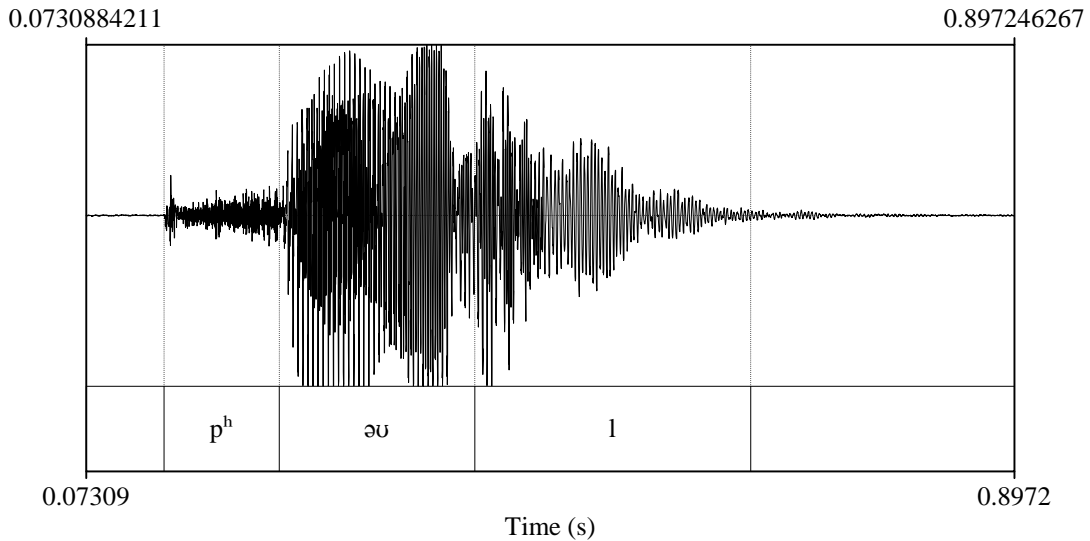


Figure 3. Waveform of 'pole'. Participant 2, recording 1, part 2 of the pronunciation test.

4.1.2 Group 2

As an example of the second group Suomi (1980) mentions overlapping of the voiceless and voiced stops. In the present study there are some examples of such sounds. One can be found from participant 1's first recording of part 1 of the test; the word 'pick' (Appendix 2, image 3) is pronounced as [pɪk] instead of [p^hɪk]. In other words, the word-initial [p] sound is voiceless but it lacks the aspiration that would essentially differentiate it from the voiced /b/ sound. The lack of aspiration can be seen in the picture; the [p] sound is very short (compared to e.g. the [t^h] sound in 'town' analyzed in section 4.1.1, image 2 in Appendix 2) and it basically consist only of the noise burst. In the lower picture we can see that the vowel sound (the pitch curve) starts clearly after the noise burst, i.e. the [p] is voiceless. Therefore it could be said that the sound does not completely match the standard pronunciation, but being clearly voiceless it resembles the correct pronunciation and can without doubt be considered an attempt towards it.

There is a similar example of overlapping also in the samples of participant 2. In the first recording of part 1 there is a phrase 'perfect bird'. According to the English language norms 'perfect' has word-initially an aspirated voiceless /p^h/, whereas in 'bird' there is a voiced /b/ sound. However, in participant 1's sample both /p^h/ and /b/ realize as a voiceless unaspirated [p] (Figure 4). When we compare the waveforms of the words we can see that they look very similar; the [p] sounds are short, and the vowel onset begins immediately after the sound burst, which essentially means that both sounds are unaspirated. Neither is there a visible voiced segment similar to the [b] sound in the word 'bowl' which was analyzed earlier in sec-

tion 4.1.1. This can be confirmed by examining the pitch curve (Appendix 2, image 4) at the [p] sections of the image.

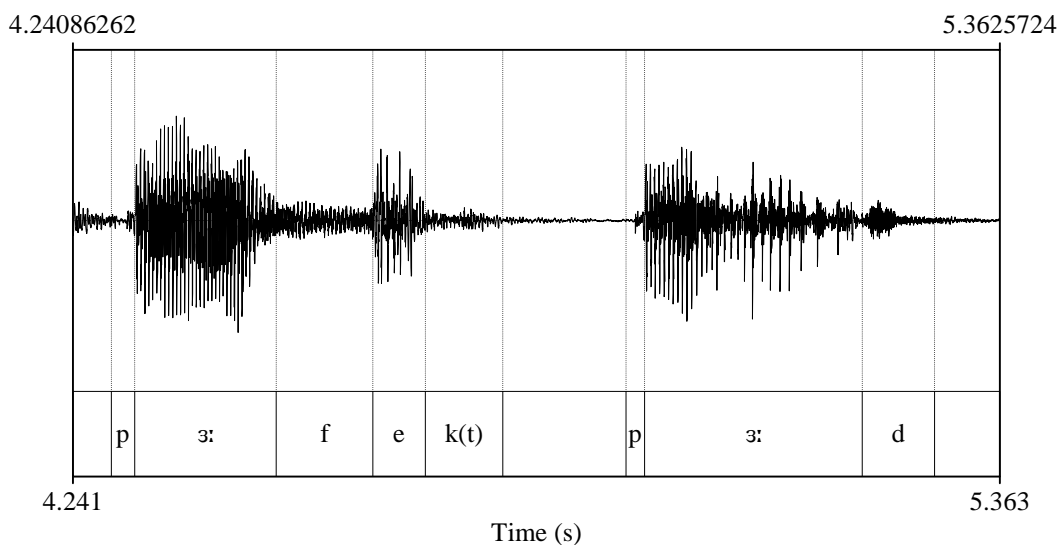


Figure 4. Waveform of 'perfect bird'. Participant 2, recording 1, part 1 of the pronunciation test.

4.1.3 Group 3

As was explained in section 2.4.2 the third group in Suomi's study consisted of samples in which the participants lacked the target language rule. As an example of this group there were samples in which the learners did not lengthen the vowel before voiced plosives. Similar sounds were found also in the samples of the present study, for example the word 'bug' (Figure 5; Appendix 2, image 5) in participant 1's first recording of part 4 of the test; the vowel in the sample lasts 182 ms (milliseconds), which is rather short, but in order to see whether the participant really applies the rule of vowel lengthening or not we must compare the sample to a word with the same vowel and a voiceless word-final plosive. In the same part there is the word 'buck' (Figure 6; Participant 1, recording 1, part 4), a minimal pair for 'bug', which suits this occasion perfectly. The vowel length in 'buck' is 187 ms, i.e. almost exactly the same. It is clear that this pronunciation of 'bug' is not in line with the target language rule, at least when compared to the vowel length in 'buck'.

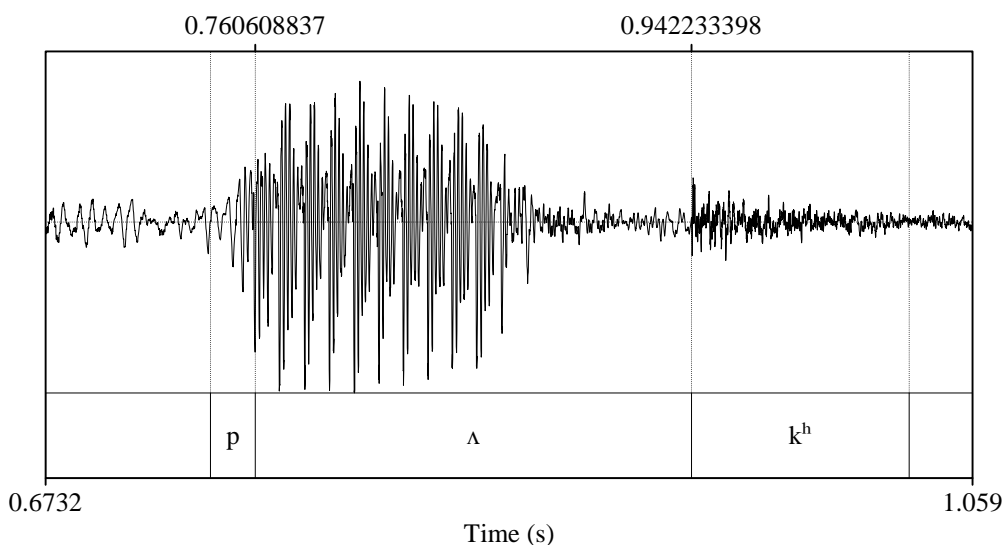


Figure 5. Waveform of ‘bug’. Participant 1, recording 1, part 4 of the pronunciation test. Vowel length: 181.625 ms

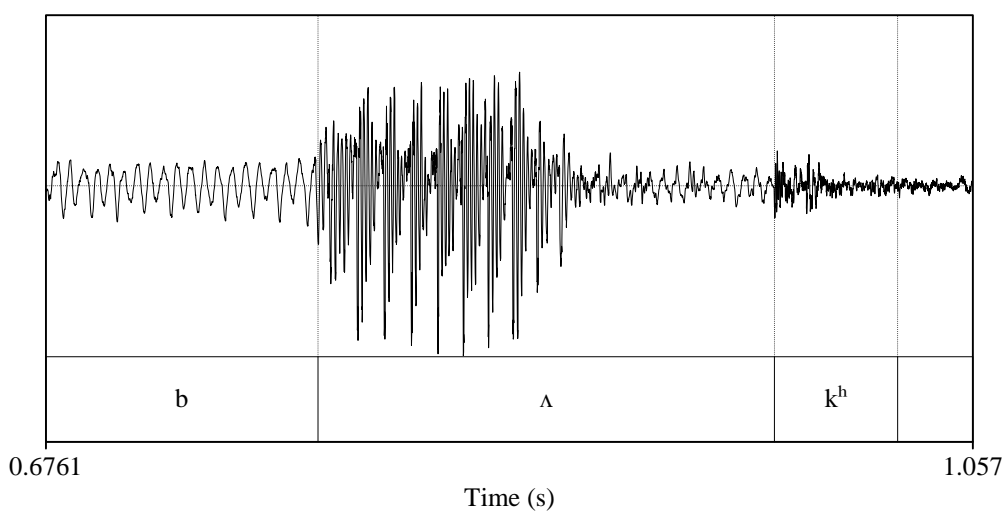


Figure 6. Waveform of ‘buck’. Participant 1, recording 1, part 4 of the pronunciation test. Vowel length: 187.442 ms

Another example of a similar situation is the word ‘dogs’ (Appendix 2, image 6), which was found in the sentence ‘*There are dogs at the docks*’ from the second recording of part 3 with participant 2. The vowel length in ‘dogs’ should, according to the norms of English pronunciation, be slightly longer than in ‘docks’, but in this sample it is 171 ms in ‘dogs’, and 195 ms in ‘docks’, respectively. It is interesting that the vowel in the word with the voiceless word-final plosive is actually longer than the one with the voiced plosive. This could be due to the fact that the latter word is in a sentence-final position and the participant, along with the falling tone (=pitch), slows down the rate of speech towards the end of the sentence. We can see

that there are also other elements of speech, such as rhythm and tone, which affect the single sounds in our speech.

4.1.4 Group 4

Group 4 in Suomi's study (1980) consists of samples in which the participants are "in possession of a rule that is definitely not used by native speakers" and they are explained as "systematic slips of the tongue". There are some interesting examples of this group also in the samples of the participants of this present study, for example the word 'downtown' (Figure 7; Appendix 2, image 7) in the first recording of part 1 with participant 1. According to the target language norms the first plosive, /d/, would be voiced and the second, /t/, would be voiceless and relatively aspirated (because it is in a slightly stressed but not word-initial position in a compound word). This sample is actually very interesting; the participant pronounces it somewhat like [d^haontaun], with an aspirated voiceless [d^h] and an unaspirated voiceless [t]. The voicelessness of the [t] sound is easily observable if it is compared to the word 'town', also from participant 1's sample, analyzed in group 1. The waveform looks very similar except for the [t]; the sound in the word 'downtown' is significantly shorter, i.e. the aspirated section is missing. However, the missing aspiration is a minor error. What makes this sample fitting in the fourth group of Suomi's categorization is the [d^h]. One might think that a voiceless /d/ would actually be very close to /t/ but instead, since the place of articulation with /d/ and /t/ differ slightly, it is possible to hear that the sound in question is pronounced clearly like /d/, except voiceless and aspirated. This kind of form would certainly not be used by a native speaker, and neither does it stem from the participant's native language Finnish. Therefore, and also because he does not repeat a similar form on the second recording of part 1, it could be described as a "slip of the tongue". A similar aspirated [d^h] did, however, recur in participant 1's sample in word-final position, for example in a few words ending with the letter *d* in part 4 of the test. He tended to aspirate several word-final plosives in the fourth part, both voiced and voiceless. However, the sound in the word 'downtown' seems to be the only example of it in word-initial position.

Similar aspirated [d^h] sounds can be found from participant 2's samples, also mostly in part 4 of the test. One example is the word 'bid' from the second recording of part 4 (Appendix 2, image 8). In the sample the word is pronounced as [pid^h]. The voicing is missing in the word-initial /b/, but the more interesting issue here, in the same way as in the sample of participant 1, is the aspirated [d^h]. The aspiration is not quite as strong as in participant 1's sam-

ple, but it is clearly observable. Similarly it is possible to hear that the sound really is /d/, although it is not visible in the waveform.

It is difficult to find the exact reason for the word-final [d^h] sounds in part 4 produced by both of the participants, but one possibility is that they both pronounced the phrases with a brief pause before the word ‘loudly’, which could lead to a slightly overly stressed pronunciation of the main word and to a short puff of air at the release of the plosive /d/.

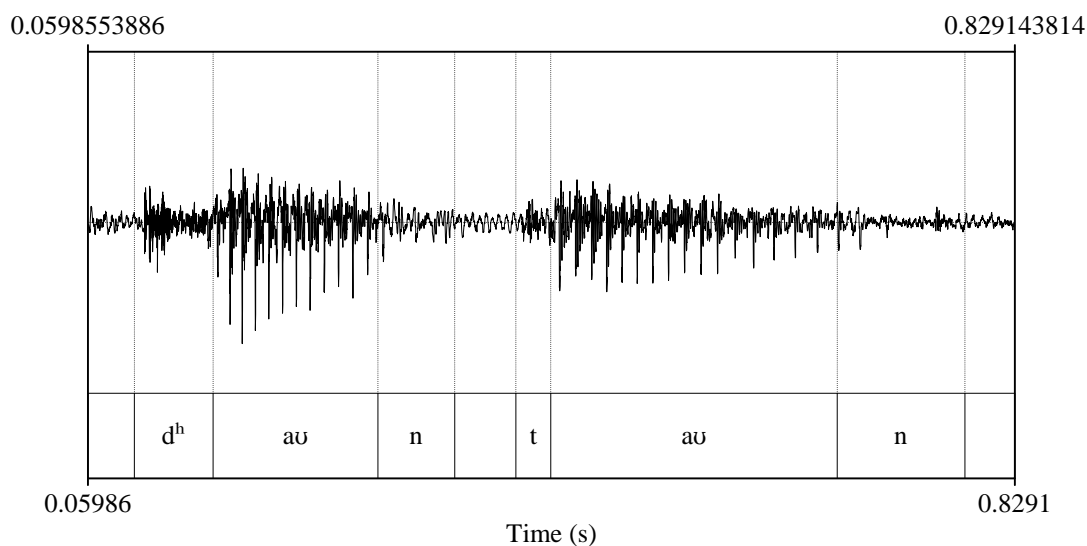


Figure 7. Waveform of ‘downtown’. Participant 1, recording 1, part 1 of the pronunciation test.

4.2 The participants’ own views

The interview section of the recordings gave the participants a chance to reflect on their own pronunciation and the test in general.

Participant 1 felt that the test was rather easy and that he did not have any major difficulties. There were some words that he felt more challenging than others, for example ‘amble’, ‘amble’ and ‘decree’, which he had not heard before. Whether the issues with these words had anything to do with the plosive being in a word-medial position or not was not covered in the interview. However, it is more likely that the problems stem from the fact that the participant was not familiar with the words.

Participant 2 felt that some words in the sample were difficult to pronounce, especially the ones with /k/ - /g/ and /p/ - /b/ distinctions. The participant described that she had problems at distinguishing some voiced and voiceless sounds, and that when she read the phrase ‘Pick one pig’ she thought that the words “kuulostaa samalta, sanon mä miten vaan” – “sound the same, however I say it”. There were some words with the /p/ - /b/ distinction that

she had learned by hearing the language, but with words that she was not so familiar with in normal use she felt that “*sen jotenkin kadottaa vaan et... et kuin sen [=oikean ääntämisen] pitää tulla*” – “*you just somehow lose... the way it [=the correct pronunciation] is supposed to come out*”. When she was telling about how she felt about the text and the sounds she distinguished the /p/ and /b/ as “*kova p*” – “*hard p*” and “*pehmeä b*” – “*soft b*”, but phonetically both /p/ and /b/ realized as [pe:], voiceless and unaspirated, in her speech.

It can be generalized that with both participants the most problematic words, in their own opinion, were the ones that they were not already familiar with or did not encounter so often.

5 DISCUSSION & CONCLUSIONS

It can be concluded that in the recorded samples there were good illustrations of each of the groups presented by Suomi (1980), and I am very happy with the results and examples found in this study. The purpose of this qualitative case study was to examine the possible issues of language transfer from Finnish to English in the speech of the two participants and give examples of them, and I feel that it was accomplished rather well.

In most cases it can be suggested that the errors in the examples were caused by the influence of the Finnish phonetic system; the examples analyzed in groups 2 and 3 (sections 4.1.2 and 4.1.3) have all plosives that differ from the correct target language rule in a way that can be interpreted as language transfer. As it was mentioned earlier in the beginning of chapter 4, participant 1 had more voiceless and unaspirated plosives in the samples, i.e. they resembled the Finnish plosives. The distinction between voiced/voiceless and aspirated/unaspirated sounds was stronger with participant 2, which can possibly be explained by the fact that she had spent a year in England using the language, and also by the generally higher grades in English in school. In their own opinion the participants had problems mostly with words they were not already familiar with, as was mentioned in section 4.2, so it could be generalized that with these participants the most beneficial and effective tool when learning pronunciation is hearing the correct input. This could have been examined further in this study by including a section of nonsense words in the test. It would have given data about whether the participants were actually aware of the certain rules of pronunciation or whether they had just learned the correct pronunciation of the words by hearing them.

The language test used in this study provided more than enough samples for analysis. The most errors were made in part 1 of the test with both participants. This may be due to the fact that when reading a longer text in a foreign language and trying to interpret the text as a

whole it is difficult to concentrate on pronunciation of every single sound. This observation is supported by part 2; it had the least errors in the test with both the participants. It is easier to focus on producing the correct pronunciation with single words or word pairs. The words in part 2 had plosives mostly in word-initial or stressed positions, which might also lead to more careful and emphasized pronunciation, one example of which is the strong voicing in the word '*bowl*' analyzed in section 4.1.1. Moreover, the minimal pairs in part 2 were positioned together, and this possibly helps differentiating the voiced and voiceless sounds.

Nevertheless, there are some shortcomings in the study; in the pronunciation test I could have used more plosives in word-medial position. This would have provided an even more thorough analysis. However, aspiration is rather rare in that position, except when the syllable in word-medial position is stressed, and the words in the test provided enough samples for analysis.

The samples of the participants could also have been compared to a sample given by a native English speaker. This would have brought an interesting point of view to the study. On the other hand, there is vast variation between both individual native speakers and the various dialects and accents of English, so the comparison would have been rather irrelevant. Instead the samples were analyzed according to the standard pronunciation of English plosives.

The whole analysis could have been based on free informal conversation, or the interview sections of the recordings could have been done in English. Informal speech could have given more genuine and authentic samples from the participants. However, with free informal speech it would not have been possible to control the number of plosive consonants in the samples. In addition, the participants were both native speakers of Finnish and expressing their thoughts and reflecting on their own pronunciation could have been more difficult in English. The interview section in general could have been more thorough; longer answers would have given more examples of the participants' dialects.

One problem was the echo in the recording situations which caused some confusion in the pitch curve when analyzing the samples. This is an issue that needs to be taken into account with future studies and recordings.

It would be interesting to continue examining the phenomenon of language transfer in phonetics and phonology further. There are many aspects of pronunciation that could be studied, for example different types of sounds. Fricative consonants have similar differences between Finnish and English as plosives analyzed in this study. Furthermore, as it was said in section 2.1, language transfer can also be seen in issues such as stress, tone and rhythm, which would be worth more investigation. Different age groups or professions could be compared by

including a wider range of participants, and a quantitative study would give generalizable results that would be useful when examining how to teach pronunciation effectively.

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APPENDICES

Appendix 1: The Pronunciation test

Part 1 – the text

Did you buy that pie when you were downtown? There is a little beautiful town down the road, and you were there with that boy who wears the cap. You took a cab, and you should go there again. I suppose you don't have anything to do. Did you take that coat to the tailor like I asked you? The tailor likes pea soup. I heard it all from my stressed dad, and he does not oppose to that. I don't like it when a bee stings me. It's never too impressive, but instead quite painful indeed. A girl abandoned her crow which grew into a perfect bird. I have a new lock on my door. There was a big log in the piggery – that's where the pigs are staying. Pick one pig that you would like to take home. You're mad to buy a mat like that if you're going to have a pet pig.

Part 2 – word pairs

Came – Game
Try – Dry
Camper – Member
Across – Agreement
Appeal – Abandon
Ample – Amble
Intended – Indented
Pole – Bowl
Two – Do
Coal – Goal
Spit – Spat
Sting – Stung
School – Skill

Part 3 – short sentences

Sit down and spin the bottle.
Embrace the degree of decree.
There are dogs at the docks.
Don't greet me with greed.
To pick a fight with a pig.

Part 4 – words in a frame sentence

Say **tip** loudly
Say **got** loudly
Say **lack** loudly
Say **pop** loudly
Say **buck** loudly
Say **cop** loudly
Say **did** loudly
Say **top** loudly
Say **part** loudly
Say **tell** loudly
Say **dad** loudly
Say **bit** loudly
Say **gal** loudly
Say **bid** loudly
Say **dumb** loudly
Say **bill** loudly
Say **lag** loudly
Say **gill** loudly
Say **bug** loudly
Say **bar** loudly
Say **pull** loudly
Say **blob** loudly
Say **keep** loudly
Say **car** loudly

Appendix 2: Images of the examples of the participants' pronunciation

Image 1. 'bowl'

Participant 2, recording 1, part 2

Slight confusion in the pitch curve during the [l] sound; the sound is clearly voiced.

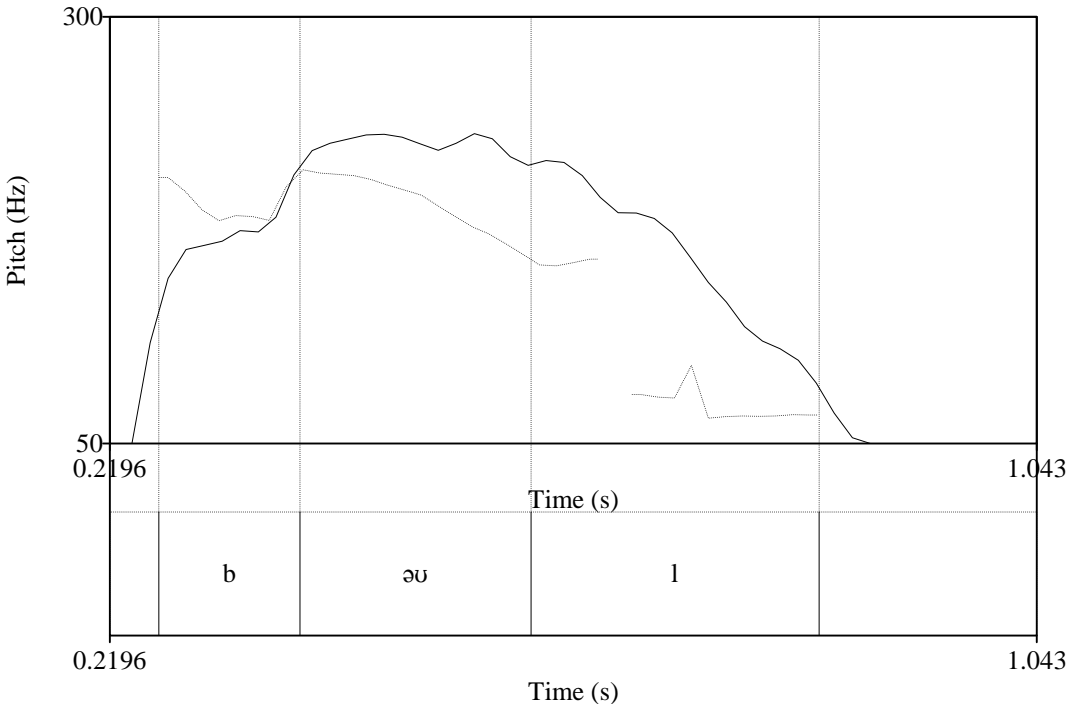
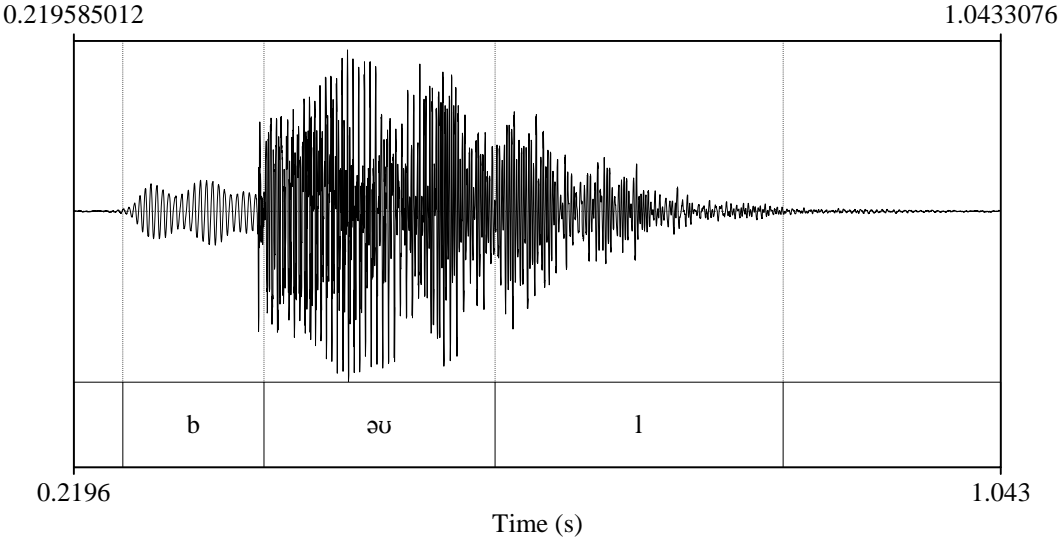


Image 2. 'town'

Participant 1, recording 1, part 1

Pitch curve is longer than the actual voicing due to the echo in the recording situation.

0.000579367352

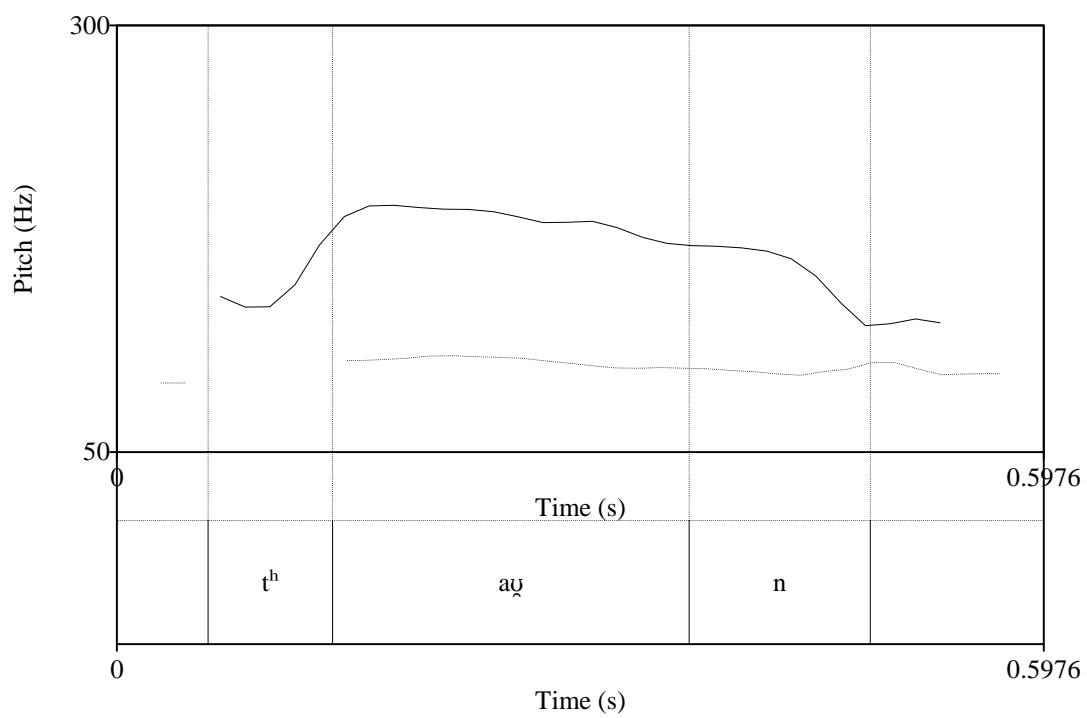
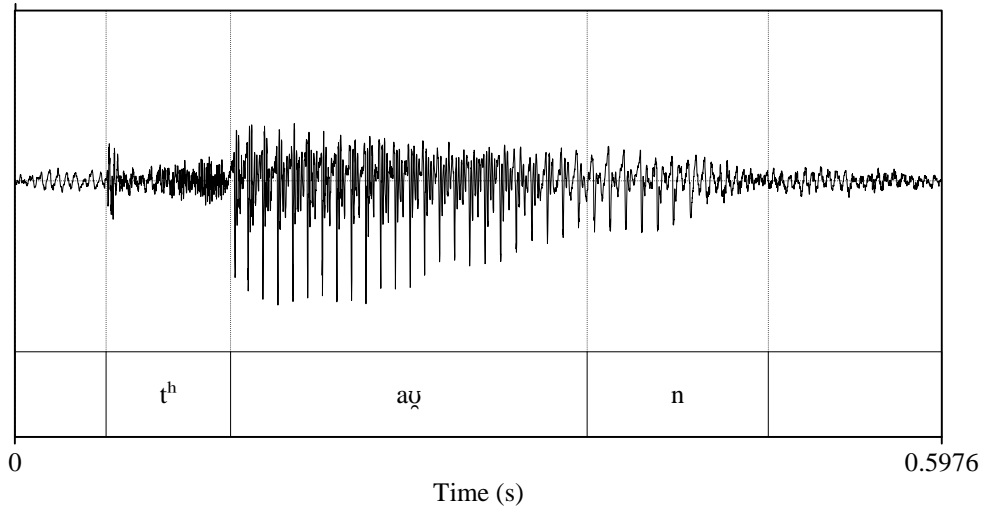


Image 3. 'pick'

Participant 1, recording 1, part 1

Pitch curve last longer than the actual voicing, possibly due to the echo in the recording situation. The [k] sound is clearly voiceless.

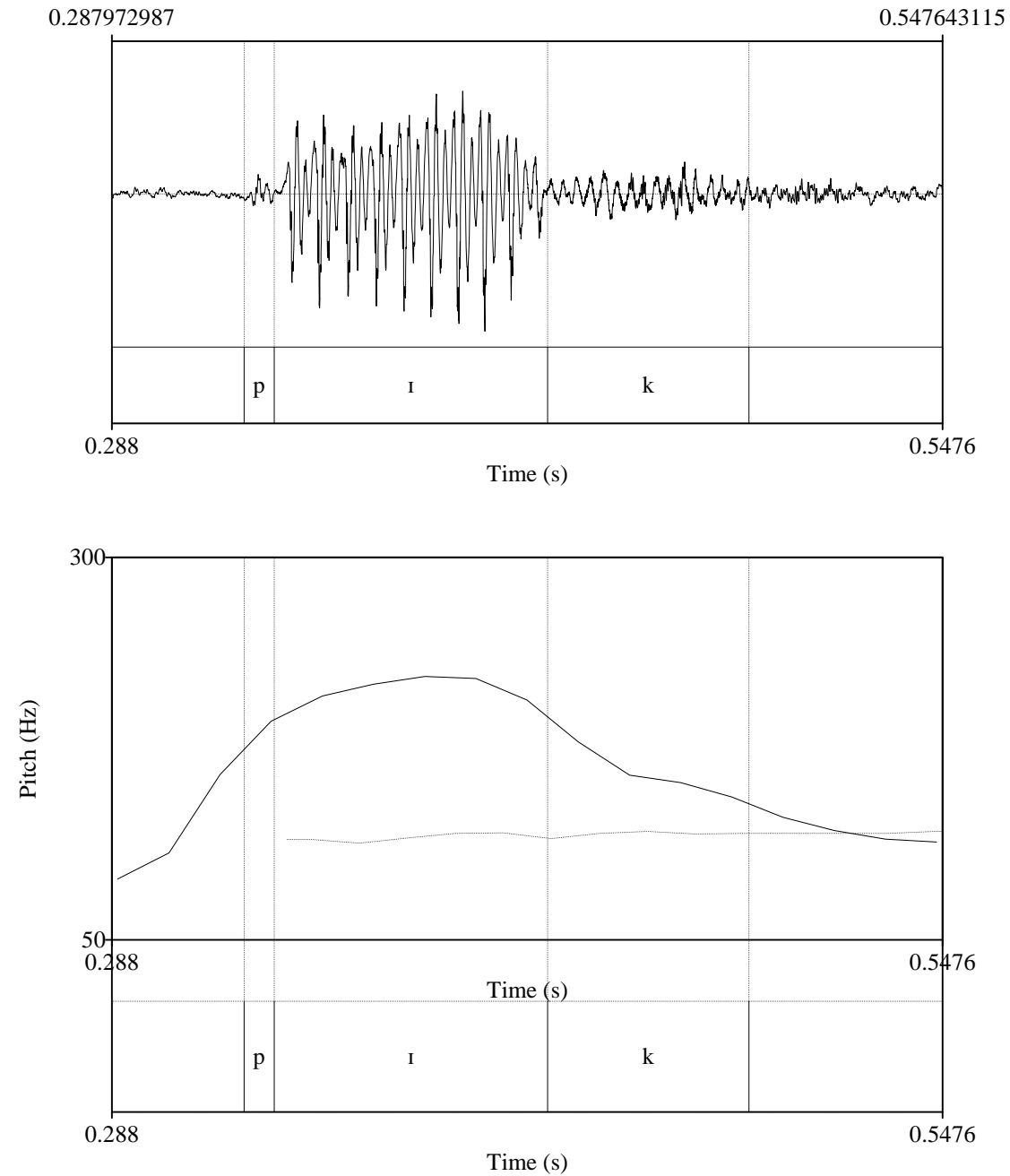


Image 4. 'perfect bird'

Participant 2, recording 1, part 1

Confusion in the pitch curve; the /f/ sound is voiceless, and both of the [ɜ:] sounds (vowels) and also the [d] are all voiced.

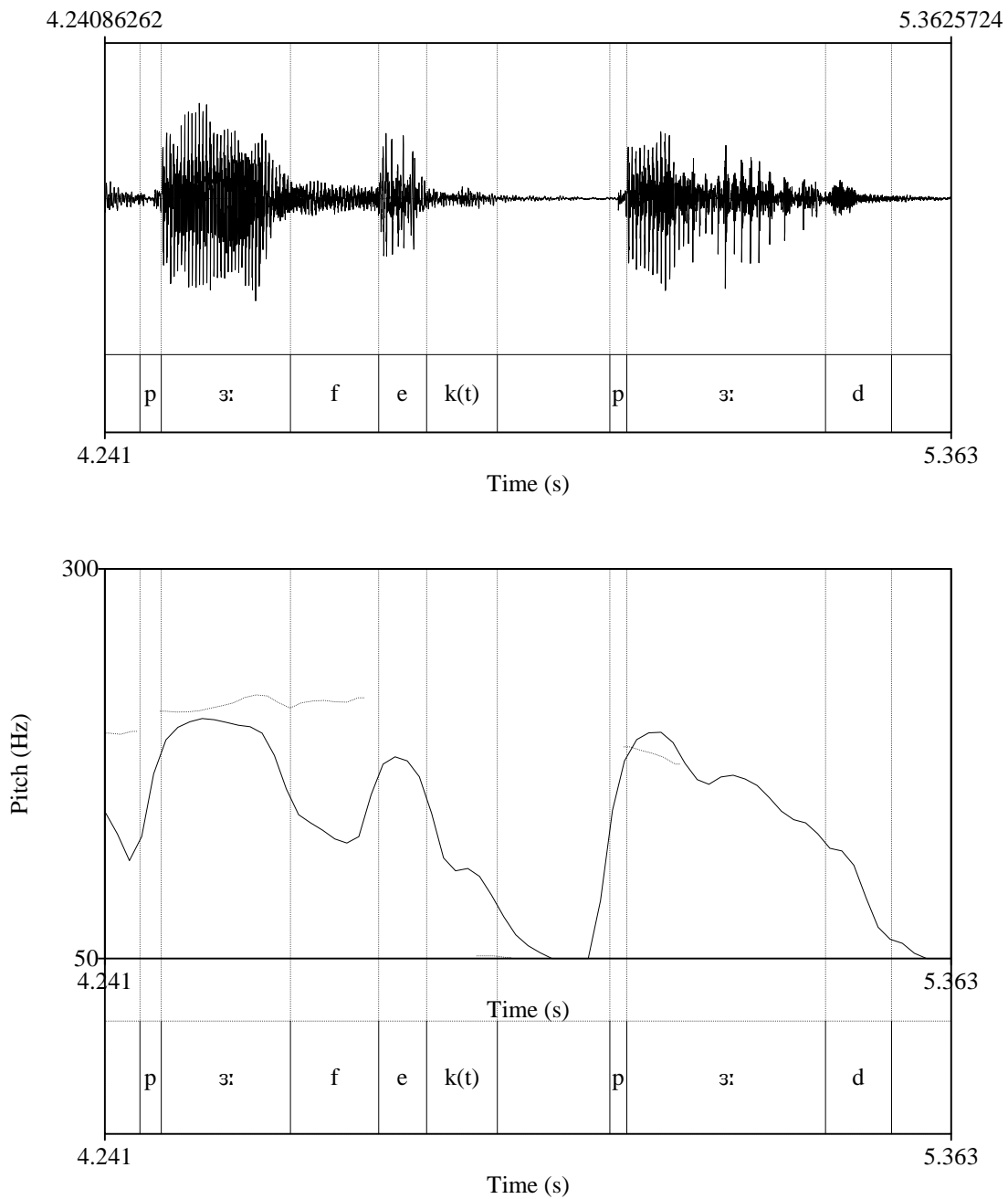


Image 5. 'bug'

Participant 1, recording 1, part 4

Pitch curve last longer than the actual voicing due to the echo in the recording situation. The [k^h] is voiceless.

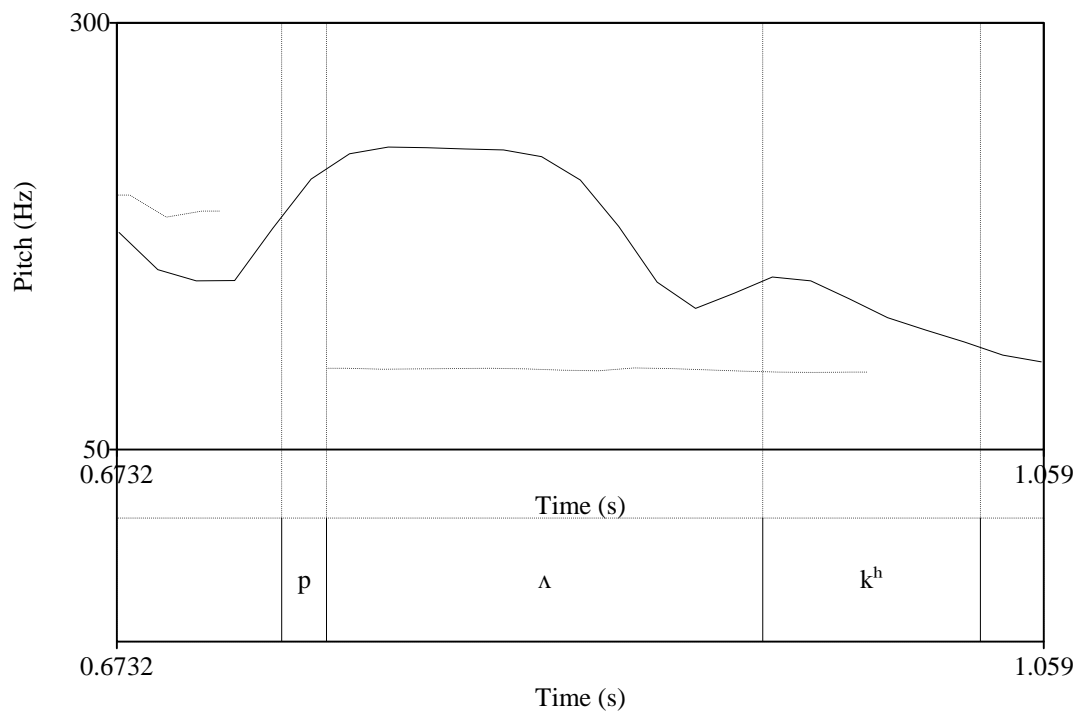
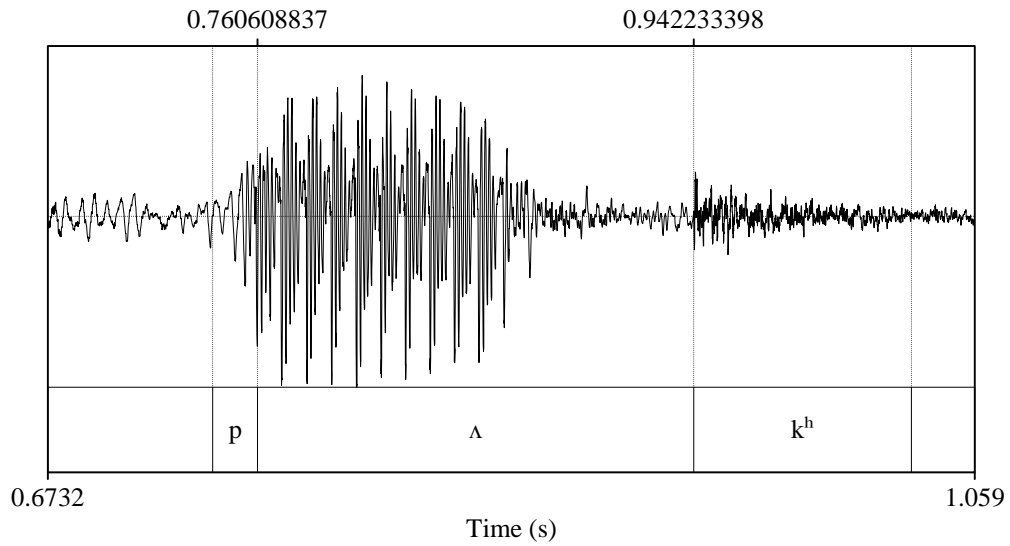


Image 6. 'dogs'

Participant 2, recording 2, part 3

Pitch curve last longer than the actual voicing due to the echo in the recording situation. The [k] is voiceless.

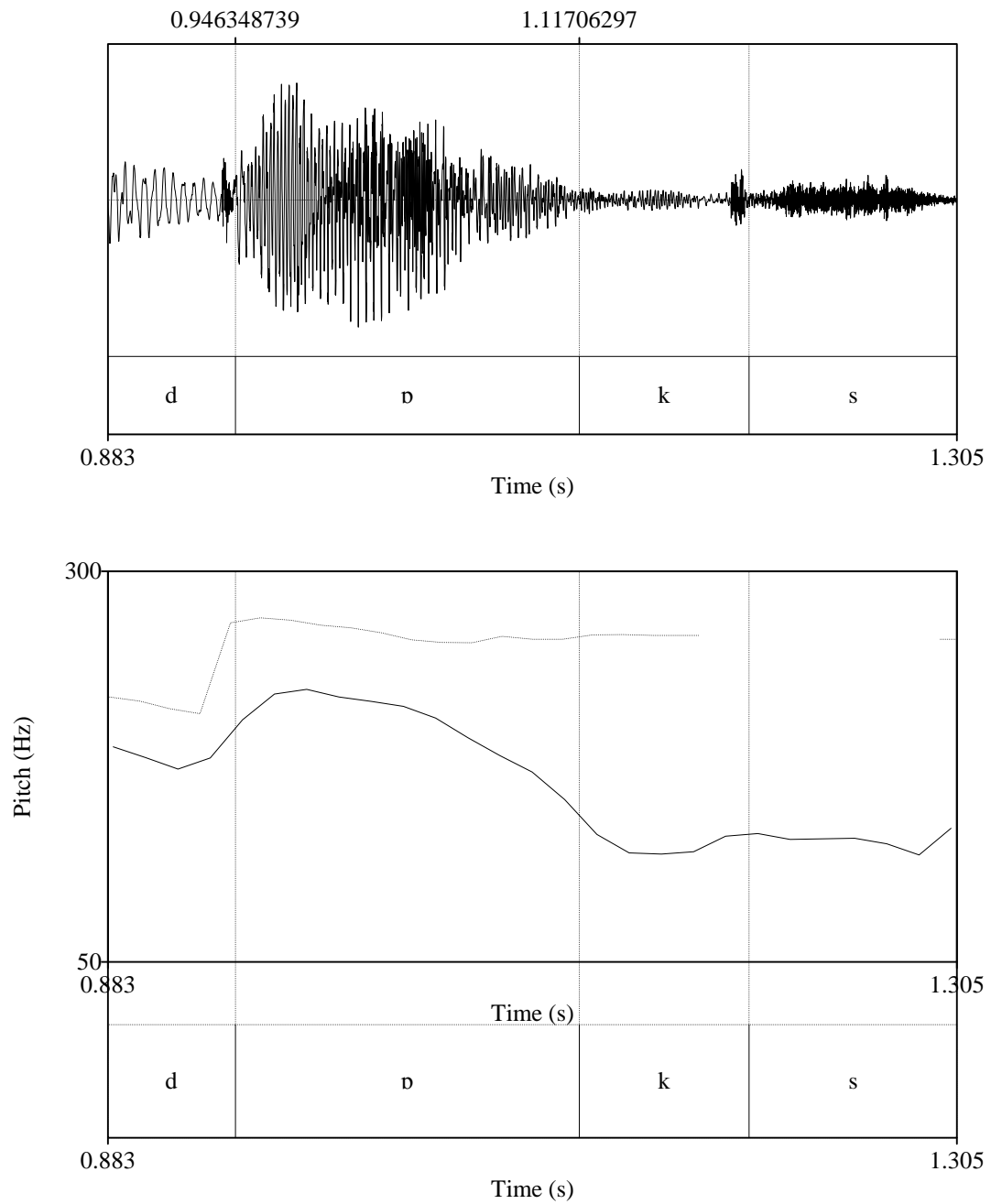


Image 7. 'downtown'

Participant 1, recording 1, part 1

Confusion in the pitch curve; both [aʊ] sounds (vowels) are fully voiced, as well as both the [n] sounds.

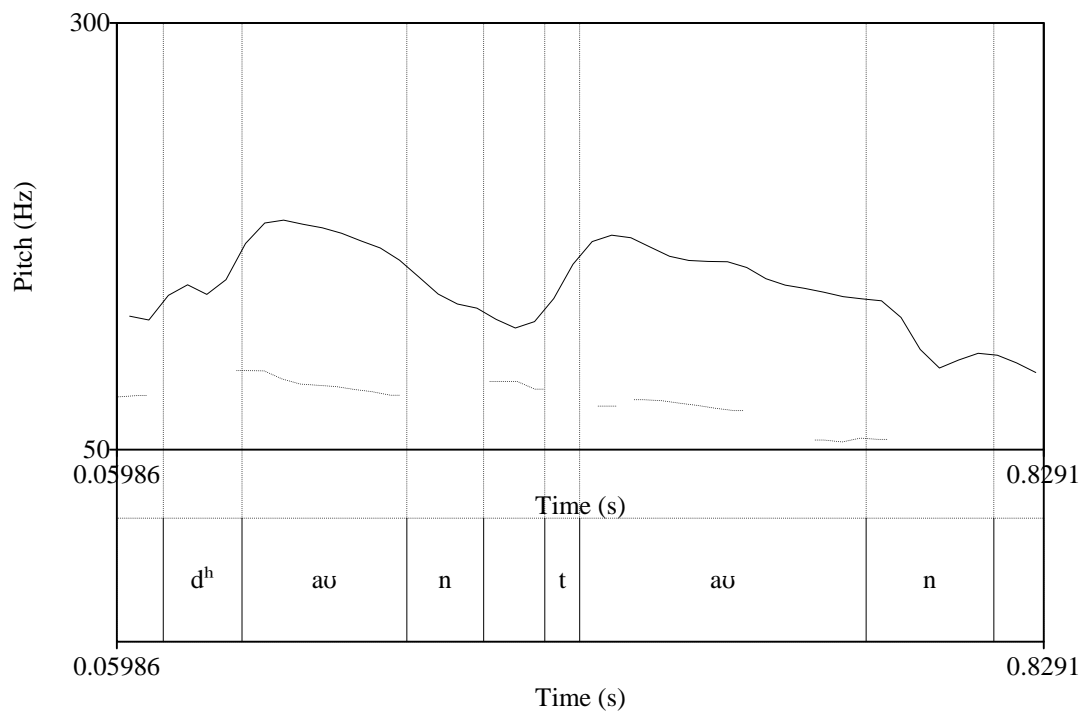
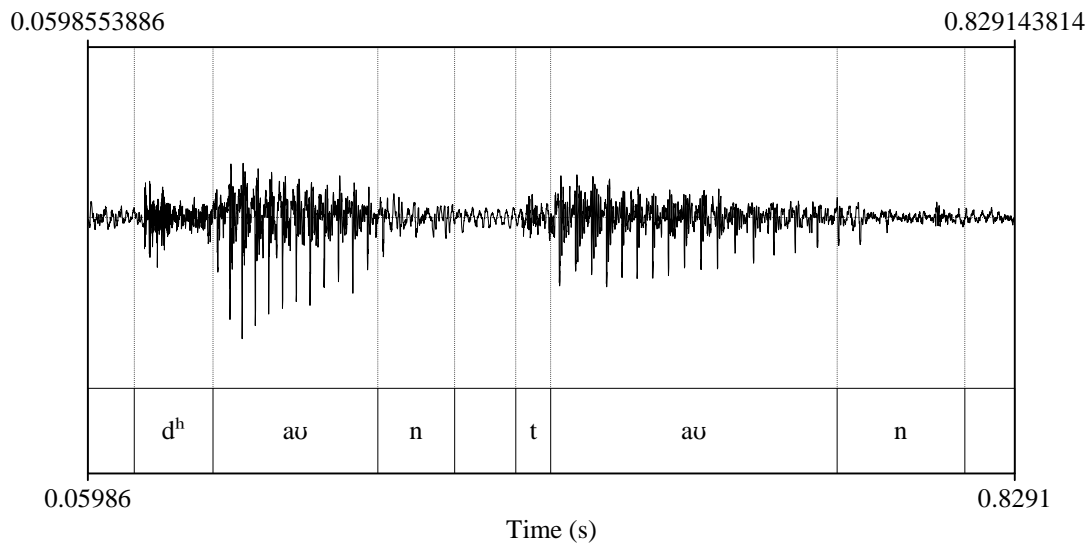


Image 8. 'bid'

Participant 2, recording 2, part 4

Confusion in the pitch curve; the [p] is voiceless and the [ɪ] is voiced (vowel).

