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THE EFFECT OF TRAINING ON THE QUALITY AND QUANTITY OF ENGLISH VOWELS IN ADULT NATIVE RUSSIAN SPEAKERS

MA thesis

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ABSTRACT

The study examined the effect of training on the quality and quantity of English vowels in adult native speakers of Russian. The experimental procedure included a short intensive course in which pronunciation instruction was integrated into general language training and accounted for 50% of the total teaching time. The instruction aimed to target pronunciation through analytic-linguistic and integrative approaches, to make it a meaningful integral component of learning and communication. The course had seven participants. In order to determine and assess the changes in vowel pronunciation and perception, participants undertook several tests, including a language perception test (POSE) and production tasks prior, during and after the training course. The production tasks involved reading a set of citation words, sentences and a short text, all of which were recorded for further analysis. The analysis of the data showed that although some changes occurred in the speech and perception of all participants, the distribution of the changes was not even across the group. While a positive effect of training was recorded in the perception of English among all of the participants, in speech the effect was not as clear and participants' improvements exhibited high variation. Some participants improved their production of vowel durations while others improved the quality of vowels. The statistics of participants' attendance and work devoted to out of class training indicated that the best results were achieved by those with high motivation and a good attendance record. Even though pronunciation training was found efficient in raising awareness of certain pronunciation features, which was evident from the perception test results, in order to achieve more profound changes in the participants' speech, the course should have been longer.

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LIST OF ABBREVIATIONS

CPH – critical period hypothesis

CEFR – Common European Framework of References for Languages

EFL – English as a foreign language

GA – General American

GB – General British

IPA – International Phonetic Alphabet

L1 – first language

L2 – second language

MARSEC – A Machine-Readable Spoken English Corpus

POSE – perception of spoken English

RP – Received Pronunciation

SSBE – Standard Southern British English

TEFL – teaching of English as a foreign language

TESOL – teaching of English to speakers of other languages

INTRODUCTION

English has become a global language and its influence can be felt across all media. An essential reason for the expansion of English has been the increasing number of non-native speakers of English and their acceptance of the language. It is a statistical fact that the overall majority of English speakers worldwide are non-native speakers and the proportion of those speakers is growing rapidly (Statista[1] 2016). For decades, accents have been a popular research object in many fields including social psychology and applied linguistics (Derwing 2003:548). Along with describing the characteristics of different accents, scholars have been interested in related socio-cultural aspects. Hence, literature on English accents has been plentiful; scholars have looked into attitudes towards regional native speaker accents and non-native speaker accents, and both native and non-native speakers' perceptions (Jenkins 2007:65). An extensive and growing literature on L2 speech has been published in journals that focus on speech production and perception as, for example, Journal of the Acoustical Society, Journal of Phonetics and Language and Speech, Journal of Second Language Pronunciation. However, many of these studies are not sufficiently interpreted or cited in teacher-oriented publications, they are often difficult to comprehend for readers without a specialised knowledge of phonetics and phonology and some of the research that has been carried out under laboratory settings may not be perceived as practical to educators (Derwing and Munro 2005:382). There still remains a gap between the interpretation of technical research and the incorporation of the findings into teacher training materials and student texts, which in turn may be contributing to misgivings among teachers about the efficacy of pronunciation training (Derwing and Munro 2005:382). For this reason pronunciation

[1] Statista – The Statistics Portal, available at http://www.statista.com/statistics/266808/the-most-spoken-languages-worldwide/, states that English is spoken as the first language by 375 million people, while the total estimated number of speakers of English worldwide is 1.5 billion.

instruction is sometimes viewed and perceived of secondary importance and is therefore often either neglected or avoided by many teachers in EFL. This is also evident in the ways it is treated in many English course books (Tennant 2007). Moreover, it is always a serious challenge for non-native English teachers to teach pronunciation of a language that is not their mother tongue.

The variation of human speech sounds between different languages has been an intriguing and interesting linguistic area for author of the thesis. Also, from a pedagogical point of view, accent and pronunciation both native and non-native is an area of special interest for the author. The way that Standard English is taught in EFL, it is primarily a written language and exhibits little variation (Dauer 2005:543), hence teaching the written form is less complicated for both native and non-native teachers. In spoken English, however, each speaker possesses a unique accent. Accent and pronunciation training in young and adult language learners have been of a specific interest to me throughout my experience as a language teacher.

For the purposes of the present MA thesis I investigated and tested an approach which consisted in offering adult learners of English with Russian mother tongue background a short intensive language course with 50 % of time devoted to pronunciation enhancement. The course was an exciting challenge to undertake as this is an area that is rarely addressed in general language courses for adults. The particular target audience (learners who are native speakers of Russian) was chosen for several reasons. Russian accent is often perceived as strong and distinctive by both English native speakers and Russian learners of English themselves. The statement was confirmed by feedback from the initial interview with participants of the envisaged pronunciation course – they evaluated their accent as either mild or strong. All participants stressed that good pronunciation was an important part of language

competence. They mentioned two major accent related problems that they experienced – difficulty in understanding native English accents and the need to enhance their non-native accent. On the one hand learners realised the importance of developing a clear and intelligible accent, which could be understood equally well by native and non-native speakers; on the other hand they mentioned the importance of training their perception and listening skills since understanding native speakers of English was often fraught with difficulties for them.

Being a native speaker of Russian and being familiar with the phonological features of both languages it came as a natural choice for me to proceed with the English – Russian language combination. The first goal of the study was pedagogical and consisted in finding and testing an effective approach, methods and techniques that would trigger positive changes in adult learners' pronunciation. The second goal of the study was linguistic — to objectively measure the changes in participants' speech.

The present thesis is divided into three main chapters. The first chapter provides the theoretical background of the research, concentrating on the definition of accent, accentedness and intelligibility, highlighting several factors that affect pronunciation and give a short overview of the history and trends, approaches, methods and techniques in pronunciation teaching. The second chapter provides a brief contrastive overview of English and Russian phonology. The third chapter contains the empirical part of the research. It gives details on the research objectives and questions; describes the design and methodology of the experimental procedure of the pronunciation enhancement course (subjects, training approach, teaching procedure and teaching materials, recording procedure and recording materials); explains the method of data analysis, presents the results of the analysis, discusses the results and suggests ideas for further

research. General findings are summarised in the conclusion, which is followed by a list of references and appendices.

CHAPTER 1. ON PRONUNCIATION IN FOREIGN LANGUAGE INSTRUCTION

1.1. Accent, accentedness and intelligibility

An accent is "the cumulative auditory effect of those features of pronunciation that identify where a person is from, regionally or socially" (Crystal 2003:3). Accentedness, a "normal consequence of second language learning", is a "listener's perception of how different a speaker's accent is from that of the L1 community" (Derwing and Munro 2005:383–385). Many adult learners of any language have a foreign accent that identifies them as non-native speakers and their accent is a sign of their origin (Kenworthy 1987). All the languages in the world possess regional and social dialects and accents. The same applies to a foreign accent – it varies from speaker to speaker. Accents, both native and non-native, can lead to difficulties in understanding between speakers and for this reason should receive special attention from learners. It is common for communication problems to be blamed on the foreigner and not the native speaker, even if some regional accents of the relevant language may be extremely diverse, likely to lead to miscommunication even between native speakers.

English, with its varieties and accents that sometimes sound different to the point of unrecognisability, may create confusion and apprehension in learners. In relation to this fact several scholars (Munro and Derwing 1999, Jenkins 2000) have stressed the necessity of intelligibility instead of native-like pronunciation. Munro and Derwing (1999:6) define accent and intelligibility as non-identical dimensions. In their study on perceived accentedness and intelligibility of foreign speakers of English by the native listeners Munro and Derwing found that although the perceived strength of

foreign accent correlated with intelligibility, a strong foreign accent did not necessarily cause L2 speech to be low in intelligibility. They concluded that it makes little sense to assess pronunciation on scales of the type that range from not accented at one endpoint to accented and difficult to understand at the other. Instead, accent and intelligibility should be regarded as separate categories. If intelligibility is accepted as the most important goal of instruction in pronunciation, then the degree to which a particular speaker's speech is accented should be of minor concern, and instruction should not focus on global accent reduction, but only on those aspects of the learner's speech that appear to interfere with listeners' understanding (Munro and Derwing 1999:21).

1.2 Factors affecting pronunciation

Lenneberg (1967) coined the term "critical period hypothesis" (CPH) in relation to language acquisition. CPH has been the subject of a long-standing debate in linguistics and language acquisition over the extent to which the ability to acquire language is biologically linked to age. According to the CPH there is a neurological period ending around age 12, beyond which a complete mastery of language is no longer possible due to changes in cerebral plasticity. In second-language acquisition, the strongest empirical evidence for the critical period hypothesis is in the study of accent, where most of the older learners do not reach a native-like level. The CPH was originally formulated in respect of first language acquisition, and stated that the critical period extends from about two years of age to the end of puberty (around age 14), after which the attainment of linguistic proficiency becomes impossible. The notion of sensitive period refers to second language acquisition, where limitations on acquisition are not as absolute as in the case of a first language. Thus, it is possible to acquire a

second language after the end of the sensitive period, but not to the extent of attaining a native-like competence (Krashen et al 1979; Long 1990; Scovel 1969).

Scovel (1969) supports the CPH with respect to second language acquisition but only in relation to phonology since in his view the ability to master the sound patterns of a language depends upon neurological and muscular development, whereas other aspects of language have no relation to this system. Long (1990) states that in the case of phonology, deterioration may begin as early as age six and in any event it is almost impossible to attain a native-like accent after 12 years of age, whereas native-like morphology and syntax is impossible after age 15. This means that the capacity to attain a native-like accent diminishes first; other linguistic abilities deteriorate during various sensitive periods (Long 1990:266).

In the view that considers accent-free pronunciation of a second language (L2) unattainable (Krashen and Terrell 1983, Scovel 1988) and holds that training has no impact on pronunciation, the general tendency in research on second language acquisition was to neglect pronunciation in favour of grammar and vocabulary. However, some of these beliefs have been contradicted by studies indicating that tailor-made training can improve learners' pronunciation in L2 to such a degree that – to human judges – the learner would sound native-like or indistinguishable from native speakers (Bongaerts 1999). In addition, it has been suggested that under certain conditions accent is affected by several other factors such as the amount of exposure and access to target language input, phonetic ability, attitude and identity, motivation and concern for good pronunciation, rather than any biological constraints related to a critical period. For example, the findings of Bongaerts et al (1995, 1997) and Marinova et al (2000) disprove Scovel's (1969) notion of the CPH for pronunciation and suggest that what accounts for the exceptional success of some adult learners is their high

motivation and the benefits of a good learning context. Along with the aforementioned factors, the cultural group that the learner identifies and spends time with can be the factor that determines whether the learner will develop a native-like pronunciation. Researchers have also found that having a personal or professional goal for learning a language can influence the need and desire for native-like pronunciation (Marinova-Todd, Marshall and Snow, 2000; Masgoret and Gardner, 2003; Bernaus, Masgoret, Gardner and Reyes, 2004; Gatboton, Trofimovich and Magid, 2005).

In addition to the aforementioned factors, the quality and quantity of input, output and feedback, the level of education, the learners' first language and their sociolinguistic realities may be crucial from the point of view of the development of their accent and pronunciation, and as such, should also be researched. In other words, speakers speak the way they do because of the social groups they belong to or desire to belong to. The role of identity in accent can be as strong as the biological constraints. Accent, along with other markers of a dialect, is an essential marker of social belonging. (Levis 2005:374–375)

1.3 History and trends of pronunciation teaching

There are three main approaches to pronunciation instruction, which are the intuitive-imitative approach, the analytic-linguistic approach, and the integrative approach (Celce-Murcia et al 1996, Chen 2007). These approaches integrate traditional methods with modern techniques. The intuitive-imitative approach assumes that a student should be able to listen to and imitate the rhythms and sounds of the target language and develop an acceptable threshold of pronunciation without the intervention of any explicit information. The invention of the language laboratory and the audio-lingual method contributed to the support of this approach (Celce-Murcia et al 1996:2).

The analytic-linguistic approach stresses the importance of explicit intervention of pronunciation pedagogy in language acquisition. Pedagogical aids such as the phonemic chart, articulatory descriptions, explanations of the form and function of prosody, and practical exercises such as minimal pair drills and rhythmic chants form the basis of an explicit program of accent modification. The analytic-linguistic approach informs the learner of and pays attention to the sounds and rhythms of the target language. This approach was developed to complement the intuitive-imitative approach instead of replacing it (Celce-Murcia et al 1996:2).

The integrative approach regards pronunciation as an integral component of communication, rather than an isolated drill and practice sub-skill. Pronunciation is practiced within meaningful task-based activities. Learners use pronunciation-focused listening activities to facilitate the learning of pronunciation. There is more focus on the suprasegmentals of stress, rhythm and intonation – as practised in extended discourse beyond the phoneme and word level. Morley (1991:497–498) proposes a dual-focus oral communication program, where the micro-level instruction is focused on linguistic (i.e., phonetic-phonological) competence through practice of segmentals and the suprasegmentals, and the macro-level attends to more global elements of communicability, with the goal of developing discourse, sociolinguistics, and strategic competence by using language for communicative purposes.

1.4 Techniques of pronunciation teaching

Today, education can draw on a variety of technical aids such as computers, digital cameras, projectors, distance education/video conferencing systems, word processing, databases, spreadsheets, drawing / graphics programs, discussion groups/list servers, instructional software (tutorials, drills and practice), presentation software,

internet, assistive technologies and instructional methods for integrating technology (MuirHerzig 2004:119–120). Phonetic alphabet, activities, such as transcription practice, diagnostic passages, detailed description of the articulatory systems, recognition/discrimination tasks, developmental approximation drills, focused production tasks (e.g., minimal pair drills, contextualised sentence practice, reading of short passages or dialogues, reading aloud/recitation), tongue twisters, and games have traditionally been used in pronunciation teaching classes. Other useful methods are listening and imitating, visual aids, practice of vowel shifts and stress shifts related to affixation, and recordings of the learner's production (Celce-Murcia et al 1996). They aim to activate multi-sensory modes of learning and are used in fluency-building activities as well as accuracy-oriented exercises. These techniques are based on the premise that students must learn the sounds first and then apply them in real speech.

In addition to these, new techniques are being developed to supplement the learning of English pronunciation. New directions in teaching and learning English pronunciation have come from other fields, such as drama, psychology and speech pathology (Celce-Murcia et al 1996). Lindsey (2015) proposes five 'smart speech practice techniques for language learners and performers', which have also been an integral part of the teaching method chosen for the present study. These techniques can be adopted and used by every language teacher without the need for special equipment. The first essential technique encourages monitoring the speed of one's own speech. The speech sounds are demonstrated at various speeds and participants are trained to slow down their speech in order to sustain the sounds they are focusing on (Lindsey, 2015:12-13). The second technique is to make learners articulate more exaggeratedly in order to modify their speaking habits and break off from their mother tongue model (Lindsey, 2015: 24-25). Thirdly, Lindsey suggests practising the technique of building

up words and phrases backwards in order to train the anticipation degree in learners. Anticipation in our own native language is unconscious, while using the technique in the foreign language teaching context it is conscious, hence by training the ability to anticipate learners become more native-like in their production and perception of speech (Lindsey 2015:34). This, however, can only be achieved by constant repetition and motivation to practice the language. Repetition can be done by asking the participants to repeat a word or a phrase several times without pausing between the repetitions in a continuous loop. By making learners repeat the newly learnt pattern several times it becomes less conscious, more natural and instinctive (Lindsey, 2015:41). The last technique is to turn back to the learners' native language, which can help to compare the native and the newly learnt speech patterns. By asking the learner to recreate the old habitual pattern and then take turns making the new and the old patterns, their ears, mind and articulators become more aware of the difference between them (Lindsey 2015:50-51).

1.5 New technologies as auxiliary tools in pronunciation instruction

Since accent is something we cannot see but that can easily be heard when we speak and listen to others, it is worth investigating as to how visualization of speech can affect accent learning. Several studies (Anderson-Hsieh 1992, Hardison 2004, 2005, Gomez et al 2008, Hinks and Edlund 2009) aimed at improving students' quality of pronunciation by using computer based tools (Anvil, Praat, RTP, etc) have shown that visualization of pronunciation in a foreign language can help and increase learners' achievement of better pronunciation.

It has been pointed out (Neri et al 2002) that computer assisted pronunciation training programs allow learners to address their individual problems, prioritise the

specific skills learners wish to develop, and individualise learners' study-pace. In addition, privacy and the self-regulated learning mode that these environments offer may lead to a reduction of foreign language anxiety; students themselves can monitor problems and improvements, which in turn might result in increased motivation; feedback can be addressed by both the teacher as well as the program.

However, computer assisted language learning and perception training programs have received criticism too. One of the important issues with such computerised systems is that it is up to the students to determine whether and how their production differs from that of natives. At the same time, students may lack the criteria and the awareness required to perform such an evaluation. Learners may also often fail to perceive phonetic differences between their L1 and the L2 and – which would suggest the need for external feedback. Another issue is the unfavourable teacher-student ratio in many classrooms and delays in feedback given to students. (Neri et al 2002)

Today learners have free and almost unlimited access to a wide variety of authentic materials such as films in their original language, YouTube audio/video files, podcasts or online dictionaries. These resources bring a wide range of accents and pronunciation models to the learners' fingertips, something unthinkable a few decades ago (Fouz-González 2015:316). The wide availability of audio material for learning languages and in particular for improving pronunciation is surely a great advancement and a helping tool for learners as well as for teachers, especially when teachers have to model a language which is not their L1.

Pronunciation training conducted for the purposes of the present study included the use of technology in the classroom in the form of audio and video resources, online dictionary recordings, and participants recording themselves. Participants were encouraged to use audio and video resources selected by the teacher to train their

perception and production skills in their own time as well. It has to be stressed that the learning recourses should be carefully selected and learners instructed on the ways how to work with them when studying independently. The feedback from participants indicated that using technology as an aid to their pronunciation training was very positive. However, when working on their own they often experienced confusion and missed teacher's guidance necessary for understanding the reasons for their mispronunciations and the ways to overcome them.

1.6 Pronunciation model, pronunciation instruction and language instructors

Spoken English exhibits wide variation in its pronunciation both diachronically and synchronically. This variation is so extensive because the language is spoken over a very wide territory as the first and as the second language. In general, the regional dialects of English are mutually intelligible. Although there are many dialects, the following are usually used as prestige or standard accents: Received Pronunciation (RP) for the United Kingdom, General American (GA) for the United States and General Australian for Australia. (Clement 2012:4)

Therefore, it is important to stress to the learners of English that they should expect to encounter considerable variation in pronunciation and that none of the varieties is more correct than the others. However, Gimson (2014:325) suggests that the English teacher should select and follow one specific model and that this model should be RP, GA (General American) or one formed by an amalgam of features from different varieties, such as the lingua franca, a model suggested by Jenkins (2000).

The type of model to use in teaching depends on several factors: 1) the teaching materials available, 2) the region the learners come from or are likely to use English in, 3) teachers' own preferences, knowledge or ability to model a particular variety.

Materials for teaching English available and used today in Estonia are predominantly those written in the UK and the English modelled in them is either RP or Standard Southern British English variety. Materials dedicated to pronunciation vary with many concentrating on either General British or General American model. It is worthwhile to make preferences for the pronunciation model also depending on the region learners would need to apply their English in. For those learners who expect to have frequent contact with native British speakers, RP or General British might be the most suitable as a target model, whereas for countries which have traditionally been influenced by the U.S., it may be more practical to use the General American model (Gimson 2014:326). Finally, teachers' own abilities, preferences and knowledge to model a particular variety play their role on how pronunciation is chosen to be taught. The issue becomes difficult and in case of pronunciation instruction often even unattainable for the non-native teachers. Therefore, since pronunciation instruction remains a demanding and sensitive topic for non-native teachers, they should be encouraged to enhance their pronunciation through adequate training and set attainable goals for themselves and their students.

Regardless of the fact that non-native teachers outnumber native teachers by 5:1 (Kiczkowiak 2014), when it comes to choosing between native and non-native models it appears that the mainstream TEFL/TESOL market still favours the 'native' model. On the other hand, prominent linguists (Crystal 2014, Jenkins 2000, Derwing and Munro 1999) consider the attainment of native-like pronunciation irrelevant and out of date. As David Crystal (2014) puts it: "[native-like pronunciation] is no longer the point…the only one category of person who needs to sound native – i.e. totally lose a native speaker identity – … is: spies. Everyone else should be proud of their identity and not wish to lose it" (Kiczkowiak 2014).

When it comes to pronunciation training courses they are frequently marketed as accent reduction training and commonly the aim of the learners is the elimination of a foreign accent. It should be stressed, however, that although native-like pronunciation is achievable in rare occasions in adult age, such cases are more of an exception rather than an achievable ideal (Munro and Derwing, 1999) and teachers should therefore be careful in setting such targets for their students. Hence, a realistic target should rather be enhancement of pronunciation and intelligibility improvement.

Finally, a big challenge in pronunciation teaching continues to be posed by the insufficient degree of collaboration between theoreticians and researchers on the one hand and language teaching practitioners on the other. Teacher training programs should ideally offer to teachers and teacher training students courses and materials that provide them with expertise in phonetics and phonology to a level that would allow them to assess their students' needs and problems adequately, and permit them to evaluate research findings, materials, and techniques critically (Dewing and Munro 2005).

To conclude, pronunciation is an important part of linguistic competence that needs a lot of specialised attention but still remains 'terra incognita' in terms of finding the best approach to teach it. It seems that the TEFL/TESOL market demands native or near-native pronunciation while the prominent linguists put in doubt the need for near-nativeness and stress the importance of intelligibility. Nevertheless, the author of the thesis believes that with regard to pronunciation teaching, EFL teachers should be knowledgeable and consistent in their choice and use of a model and the reference point for both teachers and learners should be a native model.

CHAPTER 2. CONTRASTIVE ANALYSIS OF PHONOLOGICAL SYSTEMS OF ENGLISH AND RUSSIAN

According to phonological classification, languages can be vocalic and consonantal (Arakin 2005:64). The vocalic group includes languages such as Dutch, English, German, French and others. The consonantal group includes languages such as Abkhaz, Arabic, Hindi, Hungarian, Lithuanian, Polish, Russian and others. (Maddieson 2013)

The structure of the phonemic inventory is important for defining a typology of languages. One of the components of the structure is the quality and number of correlations and oppositions. In English and Russian, binary opposition is present in the structure of some consonants, such as /p/ and /b/, /t/ and /d/, /k/ and /g/, etc, or the opposition of front and back vowels. Phonological correlation is related to phonological opposition, that is, where two phonemes of the phonemic system are in pair-wise opposition on the basis of one feature and congruent on the basis of all the other features. Both English and Russian consonantal phonemes correlate on the bases of: voicing (/d/ and /t/, etc), nasality (/m/ and /b/); but differences occur in the rate of palatalisation (nearly every consonant can be palatalised in Russian). (Arakin 2005:65)

Phonological neutralisation is yet another phenomenon that is impossible in English but occurs in Russian. Neutralisation cancels the binary opposition as, for example, at the end of a syllable, where Russian voiced consonants become unvoiced, which makes *кот* ‘cat’ and *код* ‘code’ sound the same. Such neutralisation in English would be considered a case of mispronunciation and may lead to misunderstanding (*hat* and *had*).

2.1 Characteristics of vowel system in English and Russian

English is usually considered to have 12 monophthongs and 8 diphthongs. Russian has 6 monophthongs and no diphthongs.

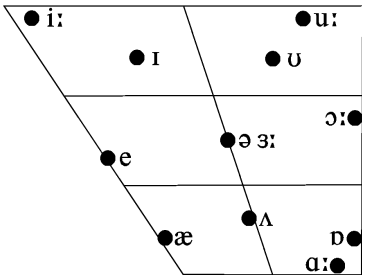

Figure 1. IPA vowel chart for RP monophthongs (Roach 2004)

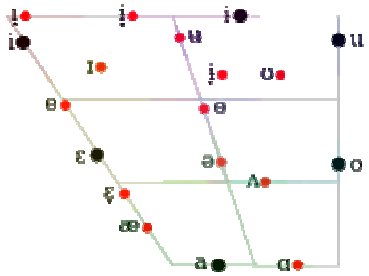

Figure 2. IPA vowel chart Russian monophthongs. Black dots – principal vowels, red dots – allophones (stressed and unstressed) (Jones 1969)

As seen from the chart in Figure 1, English vowels display a length contrast, which is absent in Russian (Figure 2). In addition, the articulatory position of English vowel phonemes is different compared to the position of Russian vowel phonemes, i.e. none of the Russian vowels' positions overlaps the position of any of the English cardinal vowels. It is, however, possible to see that some Russian allophones are positioned very near the English cardinals, which makes knowledge of these allophones and of their operation in Russian potentially helpful in finding possible solutions for pronunciation difficulties of Russian learners of English.

The English vowel system contains 9 diphthongs: /aɪ/, /eɪ/, /ɔɪ/, /aʊ/, /əʊ/, /ɪə/, /eə/, /əʊ/ (Roach 2004:20), whereas the Russian vowel system has none (Arakin 2005:71). The distribution of the vowel phonemes in English and Russian displays typological differences. In English, open syllables, i.e. CV type syllable structures, can end in either a long vowel phoneme or a diphthong (or in /ə/ in an unstressed syllable such as *potato* /pəˈteɪtɔʊ/, *teacher* /ˈtiːtʃə/). Short vowel phonemes /ɪ/, /e/, /ɒ/, /æ/, /ʌ/, /ʊ/ cannot occur in the end position of a CV type syllable. In contrast to the distribution of vowel phonemes in English, Russian displays no restrictions on the position of any

vowel in a syllable. The only exception is the /ы/ phoneme that can appear only after hard consonants (*выть* ‘howl’, *быть* ‘be’). (Arakin 2005:71)

2.2 Consonant phonemes in English and Russian

The number of consonant phonemes in English is 24 while in Russian it is 35. The high number of consonantal phonemes in Russian is achieved by the softening or palatalisation of hard consonants. Both languages have plosives, fricatives, affricates, and sonorants. There are 6 areas of articulation in English – labial, interdental, alveolar, velar, postvelar, and uvular. The interdental and uvular areas of articulation are not present in Russian and the alveolar area of articulation is compensated by the dental area. The inventory of Russian consonants is larger due to the number of palatalised allophones of most of the consonants. Nearly every consonant in Russian has a palatalised[2] pair – /p/ and /p’/, /п/ and /п’/, /c/ and /c’/, etc. (Arakin 2005:72)

The major phonetic differences between Russian and English are found in the classes of fricatives – with the phonemes /h/, /ð/, /θ/ – and sonorants where Russian misses the /ŋ/. Both English and Russian exhibit consonant correlation. In English 16 consonants out of 18 make up 6 correlating pairs: /p/ – /b/ *pill* and *bill*, /t/ – /d/ *team* – *deem*, /k/ – /g/ *coat* – *goat*, /f/ – /v/ *fat*– *vat*, /s/ – /z/ *seal*– *zeal*, /tʃ/ – /dʒ/ *rich* – *ridge*. These correlating pairs constitute strong phonological oppositions in all three positions of a word – beginning, middle and end. In Russian, 26 members of the voiced-unvoiced opposition make up 9 correlating pairs: /п/ – /б/ *путь* ‘path’– *будь* ‘be’, /п’/ – /б’/ *пить* ‘drink’ – *бить* ‘beat’, /т/ – /д/ *том* ‘volume’ – *дом* ‘house’, /т’/ – /д’/ *тень* ‘shadow’ – *день* ‘day’, /к/ – /г/ *кол* ‘pole’ – *гол* ‘goal’, /с/ – /з/ *собор* ‘cathedral’ – *забор* ‘fence’, /с’/ – /з’/ *сев* ‘sowing’ – *зев* ‘throat’, /х/ – /к/ *ход* ‘progress’ – *код* ‘code’. (Arakin 2005:73–74)

[2] In Russian palatalised consonants are marked by an apostrophe

In addition, Russian has correlation pairs according to palatalisation. 20 consonants make up 10 correlating pairs: /б/ – /б'/ *быт* 'mode of life' – *бить* 'beat', /п/ – /п'/ *пыл* 'ardour' – *пил* 'drank', /в/ – /в'/ *выть* 'howl' – *вить* 'twist', /ф/ – /ф'/ *кров* 'shelter' – *кровь* 'blood', /м/ – /м'/ *мать* 'mother' – *мять* 'crush', /т/ – /т'/ *чистит* 'cleans' – *чистить* 'to clean', /н/ – /н'/ *нос* 'nose'– *нёс* 'carried', /с/ – /с'/ *вес* 'weight' – *весь* 'whole', /л/ – /л'/ *лук* 'onion' – *люк* 'hatch', /р/ – /р'/ *хор* 'choir' – *хорь* 'polecat' (Arakin 2005:73).

The Russian consonants undergo neutralisation process in two cases – when the voiced consonant is in the final position in the word and before unvoiced or sonorant consonants in the following word. In these cases voiced consonants become unvoiced: *жлоб* /жлоп/ 'lout', *засов* /засоф/ 'bolt', *газ* /гас/ 'gas'. This kind of neutralisation is not present in English and can lead to negative transfer by Russian speakers in L2. Understanding the typological characteristics of subsystems of consonants in both languages is directly related to the methodology of pronunciation instruction. Devoicing of voiced consonant sounds is a persistent mistake made by Russian learners of English at all levels of proficiency (Arakin 2005:74).

2.3 Characteristics of stress in English and Russian

Stress as a suprasegmental device can vary by several characteristics. The nature of stress can be: dynamic (that is determined by the strength of the exhalation), musical (determined by the height of the pitch) or quantitative (determined by the length of the phoneme) (Arakin 2005:77). In addition to length, pitch and quality, loudness has been pointed out as one of the characteristics of stress. Generally, these four factors work together in combination, though syllables may sometimes be made prominent by means of only one or two of them. In English, the strongest effect is produced by pitch

and length, while loudness and quality have a much lesser effect (Roach 1998:86). English and Russian are similar in the nature of word stress. While it is dynamic in both languages, the difference being that pitch is important in English, while in Russian an important role is played by the length (Arakin 2005:77).

The location of stress in words can be fixed (if it is assigned to a certain syllable in the word) or mobile (if it can move from one syllable to another). English and Russian differ on this point since, typologically, in English, stress can be considered fixed because in most two- and three-syllable words the stress is on the initial syllable (Arakin 2005:77). The stress usually remains on the same syllable even when more word-formative morphemes are added (*sin – 'sinful, re'fuse – re'fusal, king – 'kingdom*). English has a relatively small number of words with stress on other syllables. In contrast, in Russian stress is mobile and can move from one syllable to another in the same word (*хоро'шо* 'well'– *хо'роший* 'good', *леч'ить* 'to cure' – *'лечит* 'cures'). Similar cases of stress mobility can be traced in some English derivatives; however, they are not as many (*bi'ology – bio'logical, 'relative – re'lation – rela'tivity*).

The quality of stress allows for distinctions between primary and secondary stress. English has clearly defined secondary stress in words with four and more syllables, where the main stress falls on the second or third syllable from the end of the word (*coro'nation, assimi'lation, co'mmencement, a'nnouncement*). The secondary stress usually appears on the second, sometimes on the third syllable from the syllable with the primary stress. This feature of the secondary stress related to rhythmic alteration of stressed and unstressed syllables in words is considerably different from the same feature of stress in Russian. Russian secondary stress is weaker compared to the English one and is present only in words formed by two or more stems and therefore

the feature of secondary stress in English remains a persistent source of problems and mistakes for Russian speakers (Arakin 2005:78).

Finally, in Russian, stress distinguishes lexical units (*'замок* ‘castle’ – *за'мок* ‘lock’, *'белки* ‘squirrels’– *бел'ки* ‘proteins’, *'мука* ‘agony’ – *му'ка* ‘flour’) and morphological units (*'года* genitive of ‘year’– *го'да* plural ‘years’, *'игры* ‘games’– *иг'ры* genitive of ‘game’). In English in the case of a relatively small class of words stress serves as a differentiation device between two words belonging to different parts of speech (*'import – im'port, 'imprint – im'print*).

2.4 Features of intonation

The acoustic manifestation of intonation is the fundamental frequency F0, which is perceived by listeners as pitch. Pitch changes in English have three principal functions: 1) they signal the division of utterances into intonational phrases; 2) they signal syllables with primary and secondary accent, both in the citation of isolated words and in the longer utterances of speech; 3) the shape of the tunes produced by pitch changes can carry various types of meaning, primarily discoursal and attitudinal. (Gimson 2014:277)

There are specific features of Russian and English intonation contours which lead to misunderstandings between non-native learners of English and native speakers of English and which require particular attention in the teaching of English to the speakers of Russian. Misunderstandings may be of two types: 1) those that are specifiable in semantic terms, such as the distinction between question and statement, and 2) those that are less easily specifiable semantically, such as the distinction between a neutral, colourless statement and one that is in some way emotionally coloured. (Leed 1965:62)

Pitch patterns may vary in different languages and when learning a new language, students transfer their native pitch patterns to the new language. Both English and Russian are intonation languages, each having their own intonation contours to convey various types of attitude and levels of pragmatic force. Unfortunately, there is still limited research on Russian intonation influence in L2 English and limited longitudinal studies on intonation development (Arakin 2005:79).

2.5 Types of syllable structures in English and Russian

Syllables can have different phonemic structures; however, whatever the size of the inventory of phonemes in the two languages under scrutiny here, they form a restricted number of types that are called the types of syllabic structures. The number of these types in English is 23 and in Russian it is 20. (Arakin 2005:85)

Arakin (2005:85–88) employs the following criteria for defining syllable structures: 1) formation of the peak of the syllable by a vowel or consonant; 2) number of consonants in the onset position before the peak; 3) number of consonants in the coda position after the peak. Based on the first criterion two types of languages can be identified: 1) those where the peak of the syllable can only be a vowel (Russian, Polish, Ukrainian) and 2) those where the peak can be either a vowel or a consonant (English, Serbian, Czech). English displays syllable structure types CC, CCC, CCCC, where the peak of the syllable can be a sonorant /l/, /n/ or /m/ (e.g. *pencil* /pen-sl/, *table* /ˈteɪ-bl/, *widen* /ˈwaɪ-dn/, *servant* /ˈsɜ:-vnt/, *pistols* /ˈpɪ-stlz/, *functional* /ˈfʌŋ-kʃnl/). Such structures are not present in Russian. Hence, the typical mistake at beginner and intermediate levels is the insertion of vowel phonemes in the pronunciation of words with such syllable structure (*table* pronounced as /teɪ-bul/, *listen* pronounced as /lisen/, etc). (Arakin 2005: 85–86)

Based on the second criterion of the number of consonants in the onset position before the peak, English displays few consonants and consonant clusters. The number of consonants in the onset position in Russian can be from one to four: CV, CCV, CCCV, CCCCV (*да* ‘yes’, *два* ‘two’, *вдруг* ‘suddenly’, *всплеск* ‘splash’). English allows up to tree consonants in the onset position (*grow*, *screw*). Phonemic variation in consonant clusters in the onset position in English is restricted, whereas in Russian there are nearly no restrictions in the variation of consonants. (Arakin 2005: 86–87)

Based on the third criterion of the number of consonants in coda after the peak English allows for longer consonant clusters compared to Russian. In English, up to six consonants may appear in the coda position (e.g. *minstrels* /ˈmɪnstrlz/), Russian allows a maximum of fours consonants in clusters that occupy a coda position (e.g. *монстр* ‘monster’). (Arakin 2005: 86)

The most common syllable types in English are CVC and CV. The most common syllable types in Russian are CCVC, CVC and CVCC. Both languages also have a V type (*apron* /eɪ-prn/, *island* /aɪ-lænd/, *утюг* /ʊ-ˈtʼʊk/, *или* /ˈɪ-lʼɪ/) (Arakin 2005:87–88).

CHAPTER 3. EMPIRICAL STUDY

3.1 The objectives of the study and the research questions

The aim of the research project reported in the thesis was to study the effect of training on the quantity and quality of the English vowels in the speech of the adult native speakers of Russian. Firstly, a targeted pronunciation training of English with particular attention to vowel quality and quantity was to be provided. Thereafter participants' progress was to be monitored, assessed and measured during and following the completion of the course. Finally, objective measurements reflecting changes in participants' speech were to be performed.

The project was conceived to provide answers to the following research questions: 1) to identify what are the typical difficulties and problem areas of vowel pronunciation in English for native speakers of Russian; 2) to determine whether pronunciation instruction leads to any changes or improvements in the English pronunciation of native speakers of Russian.

3.2 Design and methodology of the pronunciation enhancement training and the recordings

3.2.1 Subjects

A total of seven learners of English participated in the experiment. All of the participants were adult females; three aged between 36 and 38 and four aged between 19 and 22. In order to match the participants to the minimum requirements of the course their level of English competence was tested by the means of a short interview, a short reading task and a test of their perceptual skills of spoken English. The minimum

required level of speaking and reading competence for participation in the course was considered pre-intermediate or level A2 – B1 according to the CEFR[3]. The subjects had to be able to converse on various topics, including speaking about themselves, their experience of learning languages and their expectations for the course. Their reading skills were tested by asking the subject to read words, sentences and a short text from a pre-intermediate level English textbook. Their perceptual skills were tested by the participants undertaking a POSE test[4] – a vowel identification accuracy test.

At the time of the experiment all of the subjects were living in Estonia. Four of them (those aged 19–22) were born and had grown up in Estonia. Two of the participants from the 36–38 age group were Russian speakers (originally from Azerbaijan and Russia respectively) who had lived in Israel for more than 15 years; one participant of the same group was born and had always lived in Estonia. All of the participants were speakers of several languages; however, every one of them considered Russian to be their first language.

All the seven participants were experienced language learners and multiple language speakers. The Israeli subjects, AS and MZ, considered themselves bilingual in Russian and Hebrew. Three of the Estonian born participants, AM, AL and AG, considered themselves bilingual in Russian and Estonian.

All but one of the participants had started learning English during their early school years (aged 8–11) and had learnt it for five or more years. Participant AM had studied English for only a year prior to the course, hence having started learning English at the age of 37. None of the participants had lived or undertaken any long stays in any of the English speaking countries. One of the participants, AM, had taken intensive

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[3] The CEFR (Common European Framework of Reference for Languages) is an international standard for describing language ability. The CEFR describes language ability on a scale of levels from A1 for beginners up to C2 for those who have mastered a language. (Council of Europe, available at https://archive.is/20120729045710/www.coe.int/t/dg4/linguistic/CADRE_EN.asp)

[4] POSE test – perception of spoken English test. The test, originally in American English, available at http://eslactivities.com/pt/, was adapted and analogous sentences were recorded by a native Southern Standard British English (SSBE) speaker.

English language courses in a language school in Estonia. None of the participants had ever had a native speaker as a teacher of English. For more detailed information on subjects' profiles, see Appendix 5.

3.2.2 Linguistic and teaching aspects of the pronunciation enhancement training

Several important linguistic aspects needed to be considered during the planning stage of the pronunciation course. In case of English, it was necessary to make a choice and decide which of the varieties to follow and how to remain consistent in modelling the chosen variety. For the purposes of the current study it was decided to follow the pronunciation of British English, in particular Standard Southern British English (SSBE). The choice was made in favour of British English because this is the variety the teacher was better informed and more proficient in, and, in addition, most of the materials chosen for the course were in the British English variety. Most of the listening material used and the modelling for the participants were done in British English. However, in some instances learners were also exposed to other models of pronunciation (American English, Scottish English, etc) but their attention was drawn to the differences and they were encouraged to refrain from mixing different models.

Another important aspect to consider was to choose the area of English phonology which could be useful to investigate both from the teaching and the linguistic point of view and would possibly benefit towards participants' general pronunciation enhancement. One such area for the Russian speakers was expected to be the area of segmentals and in particular the perception and production of vowels. Segmentals are important basic building blocks of a language and they should therefore receive specific attention in the pronunciation training; they carry an important weight on the quality of the pronunciation and hence the intelligibility of a speaker. In English, in particular, the

number of vowels is higher than in Russian. Vowels play an important role in speech as they form the nucleus of a syllable, and, can influence prosodic qualities of the language (such as pitch, intonation, intensity, tone, stress). It should be mentioned, however, that while the segmental aspect of vowel pronunciation was prioritised over the other aspects of English phonology, mistakes and errors in areas of pronunciation other than vowels were not left unnoticed or unattended they were corrected, relevant explanations were provided and a minimum of practice given.

The training of the participants consisted of 30 academic hours in class. The course spanned for 8 weeks with training sessions twice per week, each session lasting for 1.5 hours. In addition, all the participants received two academic hours of one-to-one pronunciation training where their problem areas of pronunciation were discussed and worked on. The list of topics covered during the course is added in Appendix 1 in the course outline section.

The lessons were devised in proportion whereby 50% of the time of the classes was devoted to pronunciation training only, and the other 50% were taught as a general English language course with inclusion of pronunciation activities. This proportion was chosen for the purpose of intergrating general language training, where all the language competence skills (reading, speaking, writing, listening) could be trained, alongside the targeted pronunciation training. It was decided to experiment with an intergrated approach as it was expected to be more meaningful and pleasant for the students who could then apply their newly acquired knowledge and skills.

Vowel pronunciation training included the following aspects: auditory and articulatory training of vowel length and quality, monophthong and diphthong training, schwa in unstresses syllables, learning the orthographic rules of the vowels in English, and IPA symbols. Vowel quality was an aspect which received the most specific

attention, especially the phonemes absent in Russian. The initial recording of the participants demonstrated that the most difficult vowels to produce and to recognise in the POSE test were low vowels /æ/ and /ɒ/, the central mid-low /ʌ/ and central mid-high vowels /ɜ:/ and /ə/. Qualitative discrimination of /i:/ and /ɪ/, /u:/ and /ʊ/, /ɔ:/ and /ɒ/. Participants received visual, auditory and kinaesthetic training in recognition and production of these vowels (see section 3.2.3). The discrimination of monophthongs and diphthongs was another area of difficulties. Several listening and speaking exercises were planned to work on these issues.

Vowel duration was also given much attention as Russian does not differentiate between long and short vowels. The length of vowels was detected as a problem area also during the initial POSE test, when the participants found it difficult to discriminate the vowel length in minimal pairs. A number of various exercises were used, including minimal pair exercises, drilling, kinaesthetic exercises, listening exercises where learners needed to differentiate the short and long vowels. It was useful to include the pitch and intonation aspects of pronunciation in training of the short and long vowels distinction as often English long vowels demonstrate a fall-rise pattern.

IPA symbols and the phonemic chart were introduced to the learners at the very first lesson, as it was considered an important foundational aspect for teaching pronunciation. With the help of the phonemic chart the participants received explanation on the principles how the vowels are positioned in the mouth.

English orthographic rules were an important aspect to include since the learners faced difficulties when reading in English. It was rather surprising that certain phonics rules were not known to the participants. Phonics is the system that the native speakers learn reading with; it is however rarely used in EFL. For the purpose of this course some aspects of phonics have therefore been tried and proved successful as it helped the

learners to better recognise written words and make fewer mistakes while reading. For example, the pronunciation of some digraphs and trigraphs had not been taught or known to the participants prior to the course. Several exercises targeting di- and trigraph practice were used. For example, in class participants practised the recognition and pronunciation of: 'ir', 'ur', 'er' as in *stir*, *fur*, *sterling*; 'ai' as in *train*, silent 'e' as in *mate, kite, etc*; different pronunciation patterns of trigraphs such as 'ear' as in *ear*, *heart*, *beard,* 'igh' as in *light*, *fight, etc*. It was therefore useful to link orthographic rules in the pronunciation course in order to improve the learners' reading skills and hence to improve their ability to read words correctly.

All the aforementioned aspects were trained in class; in addition, participants were given home tasks to revise and practise the material covered in the lessons. To enhance their perception and pronunciation the learners were encouraged to record themselves every week, analyse their pronunciation and compare it with the same recordings made by native speakers. For example, several texts[5] available online and recoded by native speakers of English were practised and analysed in class. Perception tasks included listening and identification of certain phonological aspects, e.g. length of vowels or length of diphthong segments, stressed vowels and schwas; pronunciation tasks included listening and consequitive repetition, listening and simultanious repetition, drilling particular sounds in the word and/or sentence context.

3.2.3 Teaching approach and techniques

According to Underhill (2005), pronunciation is the physical side of language, involving the body, the breath, the muscles, acoustic vibration and harmonics.

[5] Participants listened to and practised reading texts recoded by native speakers: "Fox in Socks" by Dr Seuss, available at https://www.youtube.com/watch?v=L8d0t_IU7FQ; "The Monkey As King" and "The Gnat and The Lion" fables by Aesop available at http://www.bbc.co.uk/learning/schoolradio/subjects/english/aesops_fables

Pronunciation can become physical, visual, aural, spatial, and affective as well as intellectual. Such a holistic approach allows learners to work from their individual strengths and to develop their own learning styles (Underhill 2005: xii). Keeping such an approach to pronunciation instruction in mind, it was decided to devise a course where participants would be helped to discover and train their pronunciation as an intellectual, visual, auditory and a physical activity. The pronunciation enhancement course (devised and taught for the purposes of the current thesis) contained elements of both analytic-linguistic and integrative approaches (see section1.3). The holistic approach thus taken aimed to combine various teaching approaches, methods and techniques, complementing traditional audio-lingual techniques by physical-kinaesthetic and visual ones. Mental, auditory, visual and physical teaching techniques targeting different learning styles were applied. The phonemic chart was used to explain the position of particular vowels in relation to the other vowels, and to explain the positioning of the vocal organs during the articulation, contributing an intellectual aspect to the learning process. Vowels that were difficult to pronounce were practised with a mirror that allowed learners to observe the position of their jaw, lips and tongue (a visual and kinaesthetic activity). The "discovery" of some of the vowels was achieved by the participants performing relevant articulatory exercises, e.g. 'the glide' from /i/ to /e/ and then to /æ/ by physically holding their lower jaw with their hand (a kinaesthetic activity). Listening tasks were given to participants to train the perception and differentiation of sounds, e.g. minimal pairs (an auditory activity). Training perceptual skills of vowel sounds recognition was done by the means of: listening to recorded materials; students recording themselves and analysing their pronunciation straight after the recording, one week and then two weeks later; playing sound recognition games (minimal pair games) with the other participants.

Throughout the course participants were trained in class and encouraged to practice, in their own time several essential techniques which could help them develop and consciously control their speech, and achieve better fluency in articulation and perception. These techniques have been described in detail by Lindsey (2015) and for the purposes of the current thesis most of them were also applied in the teaching approach used (see section 1.4).

Participants were taught and encouraged to monitor the speed of their own speech. In class speech sounds were demonstrated at various speeds and participants were trained to slow down their speech in order to sustain the sounds they were focusing on. This technique was particularly successful with vowels since by learning to speak slowly learners stopped hesitating and breaking off. With the help of the 'exaggeration' technique participants learnt to articulate the target sound. For example, English vowels /æ/ as in *black*, *cat*, *sat*, *man* and /e/ as in *men*, *bed*, *led* are the sounds that many Russian speakers do not articulate with an open enough mouth. During the training words were modelled exaggeratedly and participants were encouraged to copy. If the participant failed to copy correctly, the exercise was often supplemented by the participants monitoring themselves with the mirror. Exaggeration entailed slowing down and it was useful for training both the quality and duration of vowels. The most common English vowel sound – the unstressed 'schwa' /ə/ was successfully practised by applying the exaggeration technique. For example, in the words like *bandana*, *banana*, *computer*, *umbrella* the difference of stressed and unstressed vowels in words was achieved by making the first and the last syllables as short as possible and the middle syllables as long as possible: *band**aaaa**na*, *ban**aaaaa**na*, *comp**uuuuu**ter*, *umbr**eeeee**lla.*

The anticipation technique worked well with long and difficult words. For example, in the phrase *National Rail Enquiries* participants struggled with the stress, diphthongs and vowel length. To help them with the pronunciation, first the most difficult word and then the whole phrase was built up backwards. For the word *enquiries* the following procedure was applied: /z/ → /iz/ → /riz/ → /ə.riz/ → /aɪə.riz/ → /waɪə.riz/ → /kwaɪə.riz/ → /ˈkwaɪə.riz/ → /ɪnˈkwaɪə.riz/. A similar procedure was applied for the whole phrase: *enquiries → rail enquiries → national rail enquiries.*

Repetition in class was done by asking the participants to repeat a word or a phrase several times without pausing between the repetitions in a continuous loop. This technique worked very well in instances such as, for example, difficulties with diphthongs in connected speech. Several participants found it difficult to produce diphthongs, as, for example, /əʊ/ in *Rose knows Joe phones Sophie, Sophie and Joe don't know Rose knows*. They were asked to read the sentence with a high concentration of diphthongs 3–4 times to drill the pattern. In addition, repetition and drilling of words and phrases was expected of the participants in their free time, which, however, could not be controlled or checked by the teacher.

3.2.4 Teaching materials

Several textbooks aimed at pronunciation enhancement training were used for the purposes of the course. Most of the pronunciation training materials used were from: 1) Hancock, Mark, 2003. *English Pronuncition in Use.* Cambridge University Press; 2) Hancock, Mark, 1996. *Pronunciation Games.* Cambridge University Press; 3) Bowler, Bill, 2005. *Timesaver Pronunciation Activities.* Scholastic. Mary Glasgow Magazines. In addition, for the purpose of general English training a topic of travel was selected from the pre-intermediate English textbook: McGowen, Bruce, Richardson, Vic, 2000.

Clockwise Oxford University Press. All the materials were selected by the teacher and made available to the participants prior to the course. The list of materials used at the course can be found in Appendix 3.

3.2.5 Recording procedure

The participants were recorded prior, during and following pronunciation training. In total, three sessions of recordings were conducted. The study was carried out following the guidelines of the University of Tartu policy concerning research involving human subjects. All subjects were volunteers who had been informed of what the experiment involved, told that the recordings of their voices and their identities would not be made public and that they had the right to withdraw from the study at any point.

The first and the second recording contained: 1) a short interview with the participant, 2) reading a set of 60 words, 3) reading 25 sentences containing some of these words, 4) reading a short text from a pre-intermediate English textbook, 5) a perception of spoken English (POSE) test. The third recording procedure was more extended compared to the first two. The recordings contained: 1) a short interview, 2) reading a set of 100 words, 3) reading 45 sentences containing some of these words, 4) reading a short text from a pre-intermediate English textbook, 5) a POSE test. Recordings were made using 24bit 96kHz WAVE/MP3 Roland Recorder in a quiet setting where only the interviewer and the participant were present.

3.2.6 Recording materials

Materials used for testing purposes and recordings were partly composed by the teacher and partly chosen from various textbooks. During the first two rounds of recordings it became evident that some of the recorded samples were of poor quality

and could not be used for measurement and analysis. Therefore, to ensure that a sufficient number of good samples were taken, the number of words and sentences of the third round of recording was increased. The reading materials and the POSE test sentences used during the recording and testing can be found in Appendix 4.

3.3 Organisation and methods of measuring the data

All the seven participants of the course performed three rounds of recordings and in addition each time they performed a POSE test. For the purposes of this thesis only the data from the first and the third round of recordings and testing were processed and analysed. The data of the second round of recordings and testing were used for identifying certain persisting problems the participants had. Although the tests included words containing both monophthongs and diphthongs, for the purposes of this thesis, only the words containing monophthongs in a stressed syllable position were processed and analysed. The words which participants could not produce correctly, either because they did not recognise the word in writing or they did not know the pronunciation of the particular word, were not analysed.

3.3.1 Organisation and processing of recorded data

For the processing and the assessment of the data I faced the choice between the subjective native speaker assessment and a more objective and up-to-date computerised approach. The latter appeared to allow for more interesting possibilities to approach and analyse the data, while the subjective assessment contained several restrictions. Firstly, in order to give an assessment a native speaker should have been asked to listen to several hours of recordings, which is a time consuming task. Secondly, the native speaker should have been a trained linguist to be able to ascertain the changes in participants' speech, which given the restriction of monophthong vowels only, would

have been a highly unrealistic undertaking given the large amount of data. Thirdly, the issue of who assesses the assessor and his/her assessment would have been difficult to resolve.

The computerised approach, on the other hand, allows for a large amount of data (a large number of tokens from a high number of subjects) to be processed consistently and equally, which is something a subjective approach cannot do. Furthermore, the method devised and used for the present study can be repeated and tested with another sample group and with other language combinations.

In order to achieve objectivity in processing and assessment of the data collected I decided to use the computerised approach. The recorded data were processed using the Praat software. The sound files were annotated, whereby words were segmented and labelled in the word tier using their orthographic transcription and the clear stressed vowel phonemes of the labelled words were segmented and labelled in the vowel tier using IPA symbols. This was done to later automate the extraction of formants (F1, F2, F3) and to determine the duration of segmented vowel tokens. The formant values in Hz were converted to the auditory Bark scale[6].

A script was run through all the vowel tokens of selected TextGrid objects to calculate: 1) the durations of labelled intervals and 2) the formant values at the mid point of each labelled interval in the Bark scale. Participants' vowel formants F1, F2 and F3 in the Bark scale were extracted using Praat, and then processed in Excel. The measurements of the formants were checked for consistency and when it was clear from the values that the vowels were not read correctly by the program they were eliminated from the data (the amount of data eliminated accounted for less than one percent of the

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[6] The Bark scale is a psychoacoustical scale proposed by Eberhard Zwicker in 1961. It is "a frequency scale on which equal distances correspond with perceptually equal distances. Above about 500 Hz this scale is more or less equal to a logarithmic frequency axis. Below 500 Hz the Bark scale becomes more and more linear. The scale ranges from 1 to 24 and corresponds to the first 24 critical bands of hearing." (Smith 1999)

total).The data were grouped by the different vowels, after that the mean of formants values F1, F2, F3 of each vowel group was calculated. The mean vowel values of F1 and F2 were then plotted. The plots were used to analyse the vowel quality subject intrinsically (to track changes prior and following the training) and subject extrinsically (to compare with the native speaker values).

The durations of the monophthongs were measured also by the Praat program. The variability of vowel durations before and after the training was measured and analysed subject intrinsically (i.e. to find out whether the training triggered any changes) and subject extrinsically (compared to native speakers' mean values).

All the tokens were divided into two major parts: data of the initial recording and data of the final recording. In each part citation tokens and connected speech tokens were processed separately to allow for a comparison of the average vowels since it was expected that the speed and the quality of utterances would be different. Measurements of the duration and the first three formants were made for about 20 tokens of each of the eleven monophthong vowels for each speaker, which makes an average of approximately 200 tokens per person in total. For most vowels of most participants there were tokens available for selection, however sometimes due to interferences during the recording (participant moving away from the recorder, mispronunciations of words, participants not recognising words or the presence of external noises) the number of tokens could be fewer than average or on rare occasions there were no good tokens to be used. The results of the initial and the final values were compared to identify the nature of the changes, i.e. the directions in which the vowels moved on the quadrilateral were examined to identify whether the changes followed any consistent trends.

3.3.2 Method of measuring the duration of the vowels

Roach (2000:14–19) and Wells (1962) define vowels /ɪ/, /e/, /ʌ/, /ɒ/, /ʊ/, /ə/, /æ/ as relatively short and /iː/, /ɜː/, /ɑː/, /ɔː/, /uː/ as relatively long. For the purposes of the current research it was decided to use this classification as a reference point and not to differentiate between the duration of vowels in contexts where the vowel preceded fortis or lenis consonants (e.g. /æ/ in *hat* and *had*, or *back* and *bag*), and which could affect the vowel duration.

The short and the long vowels were measured and expressed in milliseconds. Measurements were made of the distances on the spectrograms between the point of onset of each vowel and the point of onset of the following consonant. Vowel onset was defined as the point where voicing began, and the end of the vowel was taken as the point where the voicing stopped. The mean of all the short and long vowels was calculated; thereafter the ratio between the short and the long vowel mean duration values of each participant was calculated.

The data Wells (1962) provides in his study on vowel duration in British English were used as a reference point for comparing the vowel duration ratios of the participants against the native model. Wells asserts that an important point of contrast between long and short vowels as a whole is its relative duration compared with other vowels of a similar tamber (/iː/ and /ɪ/), or with the speaker's overall average duration for all vowels. Wells measured the durations of 22 vowels in 28 speakers, which he then averaged in order to provide the speaker's mean vowel durations. Each vowel duration was expressed as a ratio of the relevant speaker's mean vowel duration[7]. The measurements made by Wells show that the short to long ratios vary considerably from

[7] Wells' table on vowel durations in British English is available at https://www.phon.ucl.ac.uk/home/wells/formants/table-6.htm.

speaker to speaker with one exhibiting ratio as high as 2.7:1 and one 1.4:1. Nevertheless, the average ratio of all the speakers stated was 1.9:1.

3.3.3 Method of measuring and plotting the vowels

The method for measuring the quality of the vowels and then applying the readings of the first two formants on a two-dimensional F1–F2 scale was adopted from the two studies by Deterding (1997, 2006). In his study "The North Wind versus a Wolf: Short texts for the description and measurement of English pronunciation" (2006) Deterding used the recordings of native English speakers to measure and plot the first two formants of clear instances of eleven monophthong vowels. In the same study he compared the results with the data from his earlier study, "The Formants of Monophthong Vowels in Standard Southern British English Pronunciation" (1997), where he used the recordings of native speakers from radio broadcasts by the BBC in the MARSEC corpus[8] (Roach, Knowles, Varadi and Arnfield 1993). For both studies he measured monophthongs and created plots of F1 against F2, using the values in the auditory Bark scale. In his study on monophthongs Deterding (1997) compares the measurements of the vowel formant values from connected speech with formant values from citation words. The study contained separate average values for male and female subjects (Deterding 1997:53). Deterding (1997) provides F1 and F2 values in Bark for average female values and the charts of F1 plotted against F2 in citation words and in connected speech (Tables 1 and 2, see pp 44–45).

For the purposes of the present study the values Deterding provided for both citations and connected speech for female subjects were used to create two separate plots (Figures 3 and 5, see pp 44). These plots were created using the template

[8] MARSEC: A Machine-Readable Spoken English Corpus is a speech corpus used in corpus linguistics consisting of a collection of recordings of spoken British English compiled during the period 1984-7 The corpus comprises 53 recorded passages, mainly recorded from the BBC, spoken in Received Pronunciation.

Deterding provides in his article “Measuring and Plotting Vowels” (2006). To enhance the visualisation and to ease the task of reading and understanding the points of articulation of the vowels I decided to add a graphic representation of a traditional vowel quadrilateral by superimposing it on the plotted values (Figures 4 and 6, see pp 45). The superimposed quadrilateral was organised in a way that it could reflect the position of the vowels as front, central, back, and high, middle and low with the /ɜ:/ and /ʌ/ being the central vowels.

	F1 (Bark)	F2 (Bark)
iː	3.10	15.03
ɪ	4.14	13.98
e	5.95	13.96
æ	8.58	12.26
ʌ	7.24	10.84
ɑː	6.99	9.60
ɒ	5.60	8.47
ɔː	4.13	7.13
ʊ	3.97	9.72
uː	3.29	10.72
ɜː	5.99	11.60

Table 1. Average female values of F1 and F2 in Bark in citation words by Deterding (1997:53)

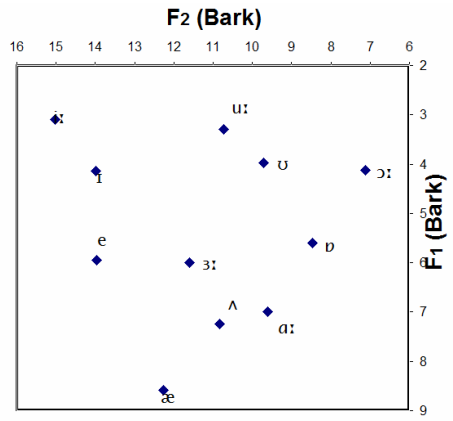

Figure3. F1/F2 values for average female vowels in citation words (Deterding 1997)

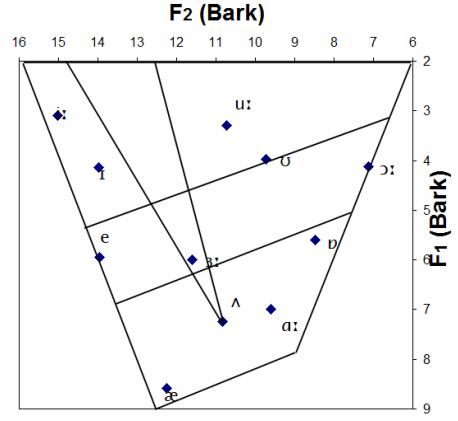

Figure 4. F1/F2 values for average female vowels in citation words on a quadrilateral

	F1 (Bark)	F2 (Bark)
iː	2.950	14.870
ɪ	3.700	13.640
e	6.530	13.300
æ	8.620	12.410
ʌ	7.940	11.010
ɑː	7.920	10.320
ɒ	6.780	9.780
ɔː	3.750	7.770
ʊ	3.940	10.440
uː	3.180	10.910
ɜː	5.630	12.020

Table 2. Average female values of F1 and F2 in Bark in connected speech by Deterding (1997:53)

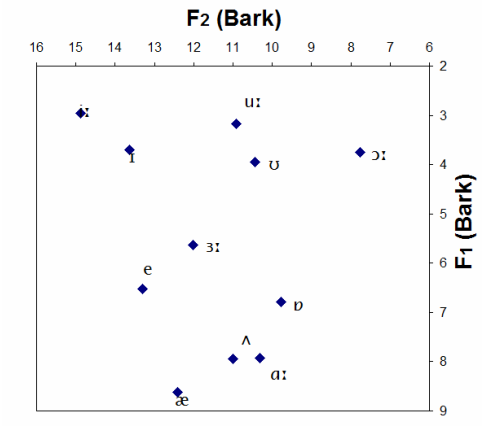

Figure 5. F1/F2 values for average female vowels in connected speech by Deterding (1997)

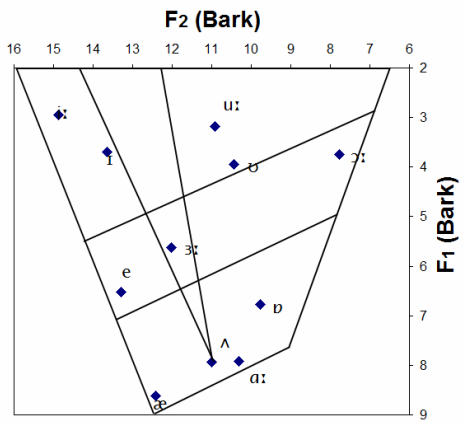

Figure 6. F1/F2 values for average female vowels in connected speech on a quadrilateral

For the current research I employed the same method of plotting vowels (F1 against F2 formant values) that Deterding used in his studies (1997, 2006). The quadrilaterals (one for citation words and one for connected speech) obtained from Deterding's data were then superimposed on the corresponding charts of the participants' values in order to reflect the deviations in pronunciation from the average native model.

3.4 Results and analysis of participants' recorded data

The following section provides the results of the vowel measurements for each participant. The measurements of the vowel durations presented in Tables 3 – 9 and

followed by a short analysis are provided first. Secondly, the results of the vowel quality measurements are presented on the charts in Figures 7 – 20. One chart represents the plotted values of vowels in citation words and the second chart represents vowel values plotted in the connected speech context. Each chart represents the movement/changes in the pronunciation of vowels between the data obtained before and after the training. The arrow indicates the direction of the changes from point 1 (before the training) to point 2 (after the training). Appendix 6 contains more detailed information about each participant's results. In the appendix the vowel values (F1, F2, F3) in the Bark scale are presented in tables for citations and connected speech; in addition, the values of the vowels are plotted and presented on separate charts. The native speaker vowel charts are presented next to the participants' charts for comparison.

Participant AG

Durations of vowels

AG	Before		After	
	Citation	Connected Speech	Citation	Connected Speech
Long	0.18	0.15	0.20	0.14
Short	0.13	0.11	0.14	0.11
Average	0.15	0.12	0.16	0.12
Ratio long:short	1.39 to 1	1.38 to 1	1.38 to 1	1.23 to 1

Table 3. AG's vowel durations

Table 3 shows that AG is inconsistent in differentiation of long to short vowels. The mean durations of long vowels in both citations and connected speech are only a few msec longer than those in short vowels. The final POSE test compared to the initial test, however, shows that AG improved in perception and differentiation of vowel durations (see Table 12, p 61). Minimal pair values show that before the training AG is inconsistent in the differentiation of long and short vowels: /i:/ in *sheep* 0.15 msec and /ɪ/ in *ship* 0.9 msec, /u:/ in *fool* 0.21 msec and /ʊ/ in *full* 0.9 msec, /ɔ:/ in s*ports* 0.19

msec and /ɒ/ in s*pots* 0.18 msec, /a:/ in *cart* 0.19 msec and /ʌ/ in *cut* 0.16 sec. In addition, 'oo' is always pronounced as long /u:/, e.g. in *book* it is 0.21 msec, the same as in *food* 0.21 msec. Following the training the ratio in citation words improved in some instances but lacked consistency: /i:/ in *sheep* 0.20 msec and /ɪ/ in *ship* 0.10 msec, /u:/ in *fool* 0.18 msec and /ʊ/ in *full* 0.15 msec, /ɔ:/ in s*ports* 0.21 msec and /ɒ/ in s*pots* 0.10 msec, /a:/ in *cart* 0.21 msec and /ʌ/ in *cut* 0.12 msec. /u:/ and /ʊ/ differentiation remained problematic: *book* 0.22 msec, *look* 0.18 msec, and *soon* 0.14 msec.

Vowel quality

The charts in figures 7 and 8 represent the plotted values of vowels in citation words and in the connected speech context. Each chart represents the movement/changes in the pronunciation of vowels between the data obtained before (1) and after (2) the training.

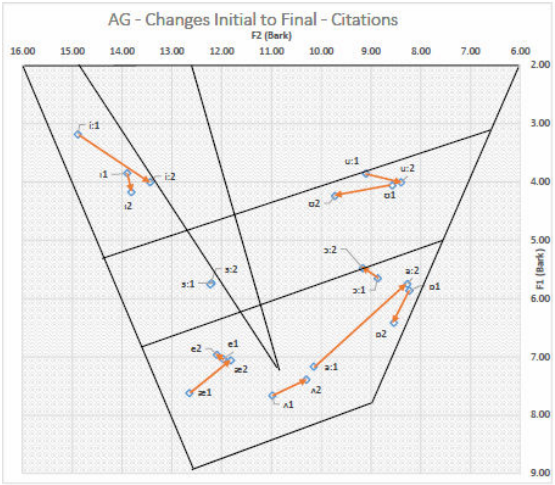

Figure 7. AG's changes initial to final – citations

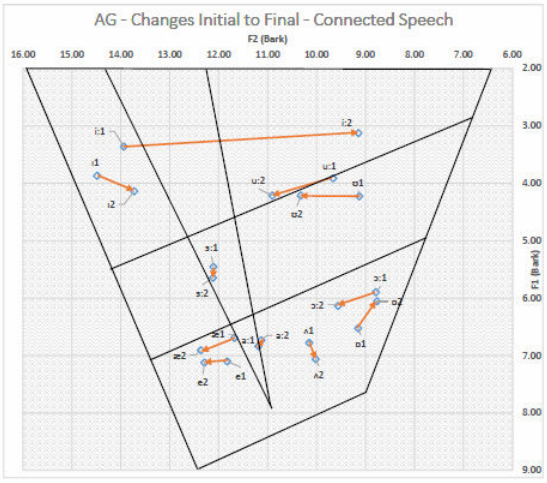

Figure 8. AG's changes initial to final – connected speech

The charts in Figures 7 and 8 indicate that AG does not always differentiate certain vowels qualitatively: /æ/ and /e/, /ɒ/ and /ɔ:/ appear as allophones of one phoneme, vowel /ʌ/ is shifted from central to back. The only vowel that is used consistently and is well articulated is /ɜ:/. The measurements of the vowel formants show that no qualitative changes in vowel pronunciation have occurred. The results

could be correlated to the attendance rate, which was 31% and no time devoted to homework.

Participant AL

Durations of vowels

AL	Before		After	
	Citation	Connected Speech	Citation	Connected Speech
Long	0.16	0.13	0.16	0.13
Short	0.12	0.09	0.11	0.09
Average	0.14	0.10	0.13	0.10
Ratio long:short	1.32 to 1	1.49 to 1	1.42 to 1	1.45 to 1

Table 4. AL's vowel durations

Table 4 shows a slight increase in the ratio of long vowels to short in citations but no changes occurred in connected speech. The average values imply that AL differentiates long and short vowels but the ratio is lower than the native speaker range calculated by Wells (1961), where the average ratio is 1.9:1. The POSE test demonstrates that AL can discriminate the durations of vowels. However, when producing minimal pairs it was clear that AL's differentiation of vowel durations is rather erratic, e.g.: *pull* (0.13 msec) and *pool* (0.13 msec), but *cut* (0.9 msec) and *cart* (0.20 msec).

Such inconsistency could be explained by several factors. One reason could be that certain pronunciation rules have not been taught prior to the training and the input received during the targeted training was not sufficient. *Book* and *look* which both have a short /ʊ/ had contrasting duration qualities; with *book* (0.20 msec) and *look* (0.7 msec). Secondly, there is still L1 transfer evident in certain instances. For example, in CVC syllables where the coda C is voiced (as in *had*) the English V is longer than in cases when the coda C is unvoiced (as in *hat*); AL transfers the Russian phonological rule on devoicing the voiced C coda to English. As a result in pairs such as *hat* and *had* the final C is always unvoiced and the vowel becomes short. AL's vowel formant measurements show *hat* (0.12 msec) and *had* (0.14 msec)

Vowel quality

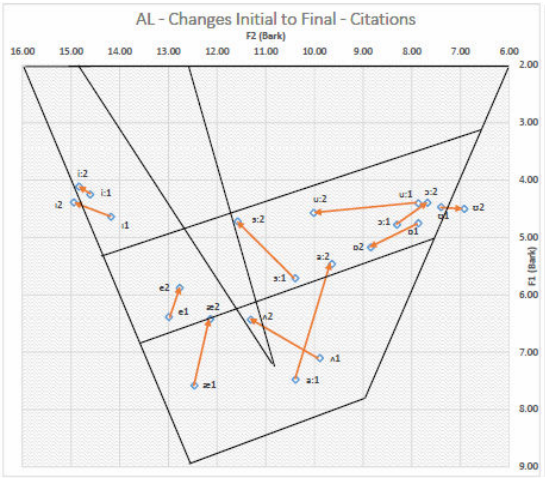

Figure 9. AL's changes initial to final - citations

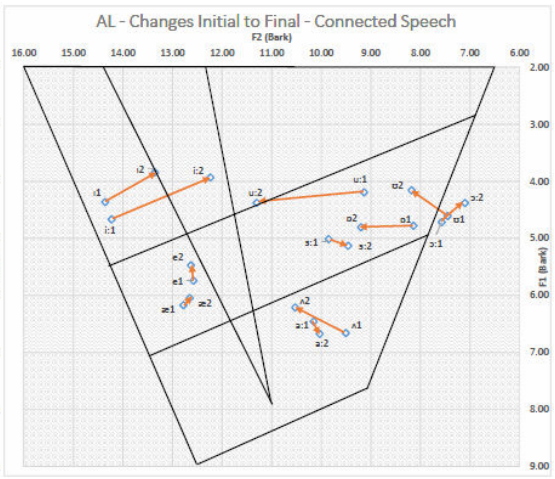

Figure 10. AL's changes initial to final – connected speech

The charts in Figures 9 and 10 suggest that AL's main problem areas initially were: low vowels /æ/, /ʌ/, /ɒ/ and central vowels /ʌ/, /ɜ/. In most cases these vowels are higher than in the native speaker model. Following the training it appears that a few changes took place. In citations /ʌ/ and /ɜ/ vowels have become more central, though low vowels moved up to mid-low positions. Long /a:/ moved from a central to a more backward position. Long /u:/ and short /ʊ/ appear to improve qualitatively in citations and connected speech. Long /i:/ and short /ɪ/ appear to improve qualitatively in connected speech. AL's data reveal that some changes in the production of phonological features occurred; both /u:/ and /ʊ/, /i:/ and /ɪ/ moved from one category to another, i.e. from the distinction on the basis of duration to the basis of quality. The data in Figure 9 hints that AL does not always categorise vowels as separate entities, e.g. /i:/ and /ɪ/ in citations appear as allophones of one vowel. However, with some vowels it appears that she is able to categorise them better, e.g. /u:/ and /ʊ/, /ɔ:/ and /ɒ/ are produced as separate entities.

The measurements of vowel formants show that some changes in vowel pronunciation have occurred. However, their nature does not show significant improvement in the quality of production. In part, this could be correlated to the

attendance rate, which was 63% and to the time devoted to homework (total of 3h.25min).

Participant AM

Durations of vowels

AM	Before		After	
	Citation	Connected Speech	Citation	Connected Speech
Long	0.20	0.15	0.21	0.15
Short	0.10	0.09	0.10	0.08
Average	0.14	0.11	0.15	0.11
Ratio long:short	2.07 to 1	1.69 to 1	2.09 to 1	1.78 to 1

Table 5. AM's vowel durations

A slight increase in the ratio of long vowels to short in citations and in connected speech is demonstrated in Table 5. The average values show that AM differentiates long and short vowels and her long to short vowel the ratio of vowel durations is comparable to the native speaker range calculated by Wells (1961). The POSE test (Table 12, p 61) also shows that AM has no problems with differentiation of vowel durations. In addition, it is worth noting that following the training she improved in the minimal pair duration differentiation. For example, before the training sessions the measurements of /æ/ in citations in *hat* was 0.8 msec and in *had* 0.9 msec, and following the training they were 0.9 msec for *hat* and 0.14 msec for *had*. /u:/ in '*fool'* and /ʊ/ in '*full'* before training was 0.11 msec and '*fool'* was 0.15 msec, whereas after the training '*full'* was 0.11 and '*fool'* 0.20 msec.

Vowel quality

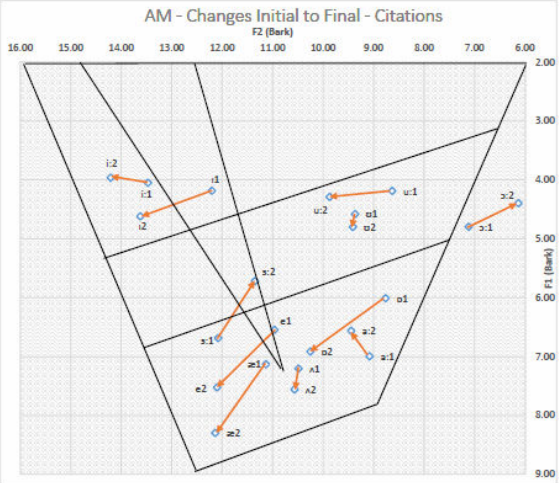

Figure 11. AM's changes initial to final – citations

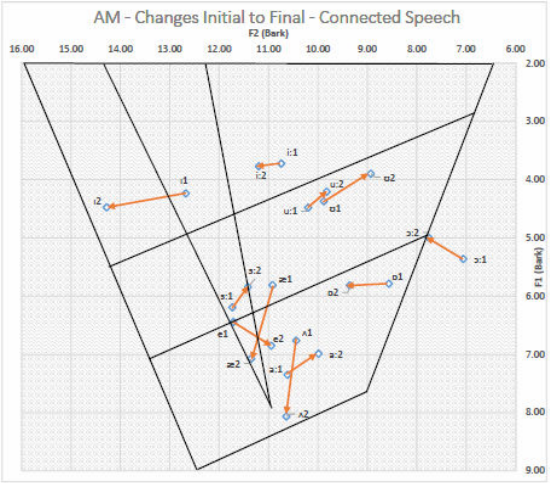

Figure 12. AM's changes initial to final – connected speech

Initially the problem areas for AM were: the low vowels, which were clustered in one area, especially in connected speech; the position of the central /ɜ:/; the position of the front vowel /e/. Following the training AM exhibits some changes in the quality of vowels. There is a qualitative change in /i:/ and /ɪ/ and /u:/ and /ʊ/ in citations. Vowels /æ/ and /e/ are further from each other in both citation and connected speech. There is evidence that AM distinguishes between vowels as separate categories, e.g. /i:/ and /ɪ/, /u:/ and /ʊ/, /æ/ and /e/, /ɔ/ and /ɒ/ are not clustered too close to each other, and hence do not appear as allophones of the same phoneme.

The measurements of the vowel formants demonstrate that several changes in vowel quality have occurred and their nature shows good improvement in the quality of speech production. The results in improvement correlate with the results from the POSE test (see Table 12, p 61), where AM exhibited a good rate of improvement in perception. The improvements also correlate with the attendance rate, which was one of the highest 94% and to the time devoted to homework (total of 10h25min).

Participant AS

Durations of vowels

AS	Before		After	
	Citation	Connected Speech	Citation	Connected Speech

Long	0.16	0.14	0.22	0.17
Short	0.11	0.09	0.11	0.09
Average	0.13	0.11	0.16	0.12
Ratio long:short	1.39 to 1	1.48 to 1	1.95 to 1	1.85 to 1

Table 6. AS's vowel durations

The data in Table 6 indicate an increase in the ratio of long vowels to short in citations from 1.39:1 to 1.95:1 and in connected speech from 1.48:1 to 1.85:1. The average duration values show that AS differentiates long and short vowels and her long to short vowel ratio is comparable to the native speaker range. The POSE test also shows that AS has no major problems in differentiating vowel durations (see Table 12, p 61). In addition, it is worth noting that following the training she improved in the vowels duration in minimal pairs. For example, before the training the measurements of /æ/ in citations as in *hat* was 0.11 msec and in *had* 0.15 msec while following the training they were 0.8 msec for *hat* and 0.22 msec for *had*. Before the training /u:/ in *fool* was 0.15 msec and /ʊ/ in *full* was 0.11msec, whereas after the training *full* was 0.11 msec and fool 0.30 msec. /ɔ:/ for *sports* was initially 0.18 msec and /ɒ/ for *spots* was 0.15 msec, after the training *sports* was 0. 22msec and *spots* was 0.12msec.

Vowel quality

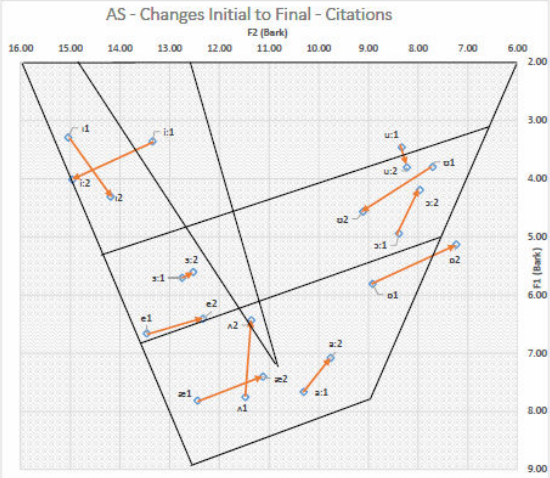

Figure 13. AS's changes initial to final – citations

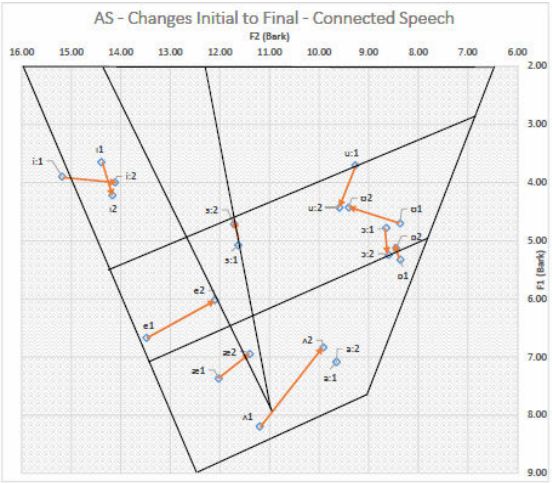

Figure14. AS's changes initial to final – connected speech

The charts in Figures 13 and 14 reveal that initially the problem areas for AS were the qualitative differentiation of /i:/ and /ɪ/ and , the low vowel /æ/. Following the training it appears that there have been some negative changes in the quality of vowels produced by AS. There is a qualitative change in /i:/ and /ɪ/, and in /u:/ and /ʊ/ in citations. However, in connected speech /i:/ takes a central position, and /u:/ and /ʊ/ are not differentiated qualitatively. Vowels /æ/ and /e/ in citations and connected speech have shifted from front to the central position and /ʌ/ has shifted to the back position in connected speech. /ɔ:/ and /ɒ/ appear as the same vowel in connected speech. A possible explanation for such a backward shift in the production of vowels may be in the negative transfer form L1. In Russian, phonemes /i:/, /e/ and /æ/ imply the palatalisation of the preceding consonant, while in English these vowels remain unpalatilised. When the consonant is not palatalised in Russian it is usually followed by a central vowel *ы* /ɨ/, э /ɛ/, а /ʌ.

AS exhibited a good attendance rate (88%); however, the time devoted to homework practice was a total of 2h25min. The measurements show that, although AS did not improve on the quality, she improved considerably on the duration of vowels.

The results of the POSE test also showed a slight improvement in her perception of vowels.

Participant EA

Durations of vowels

EA	Before		After	
	Citation	Connected Speech	Citation	Connected Speech
Long	0.14	0.13	0.15	0.13
Short	0.12	0.09	0.12	0.09
Average	0.12	0.11	0.13	0.11
Ratio long:short	1.22 to 1	1.43 to 1	1.25 to 1	1.47 to 1

Table 7. EA's vowel durations

Table7 shows that the training triggered no major changes in the ratio of long vowels to short neither in citations nor in connected speech. The average duration values show that EA differentiates long and short vowels better in connected speech (ratio of 1.47 to 1) but nevertheless it remains below the average native speaker ratio. The POSE test also shows that EA has sometimes difficulties in differentiating vowel durations. Minimal pair vowel duration values demonstrate that before the training EA makes no differentiation between long and short vowels: /i:/ in *sheep* 0.9 msec and /ɪ/ in *ship* 0.8 msec, /u:/ in *pool* 0.14 msec and /ʊ/ in *pull* 0.15 msec, /ɔ:/ in *sports* 0.12 msec and /ɒ/ in *spots* 0.14 msec, /a:/ in *cart* 0.11 msec and /ʌ/ in *cut* 0.10 msec. Following the training a few changes took place but more of a rather sporadic character: /i:/ in *sheep* 0.9 msec and /ɪ/ in *ship* 0.6 msec, /u:/ in *pool* 0.17 msec and /ʊ/ in *pull* 0.13 msec, /ɔ:/ in *sports* 0.15 msec and /ɒ/ in *spots* 0.17 msec, /a:/ in *cart* 0.15 msec and /ʌ/ in *cut* 0.9 msec. The results of the vowel duration measurements suggest that participant EA needed more time to internalise the spelling-to-reading rules, since while reading she remained hesitant which diagraphs represented short and long sounds.

Vowel quality

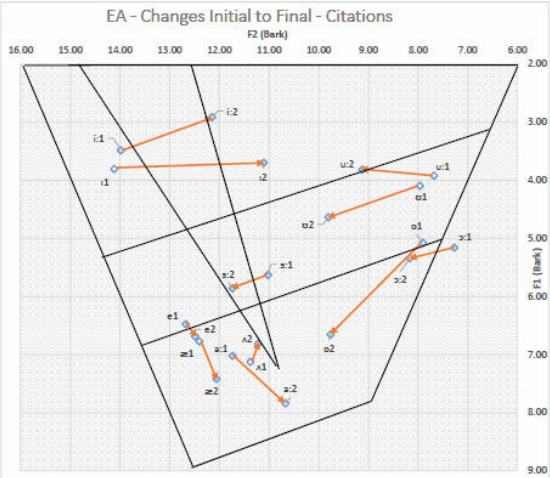

Figure. 15. EA's changes initial to final – citations

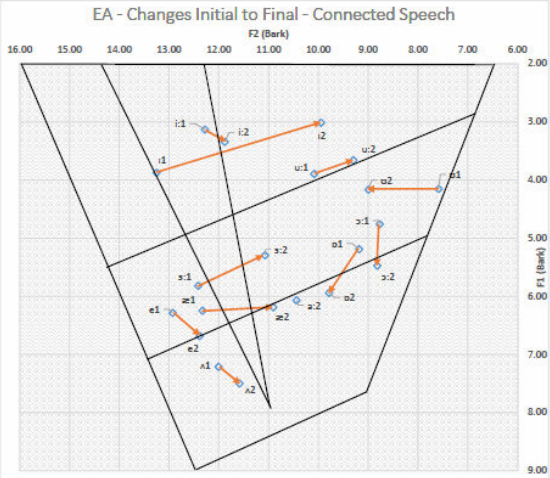

Figure 16. EA's changes initial to final – connected speech

The data in figure 15 show that initially in citations vowels pairs /e/ and /æ/, /a:/ and /ʌ/, /u:/ and /ʊ/, /ɔ/ and /ɒ/, /i:/ and /ɪ/ were clustered next to each other and appear as allophones of one phoneme. There is some positive movement of the vowels after the training in citation words, where some appear to take their own identity and are differentiated qualitatively. In connected speech as can be seen in Figure 16 EA's vowels /e/, /ɜ:/ and /æ/ were initially clustered in one area and appeared as allophones of one phoneme. /ɔ/ and /ɒ/ appeared as allophones of one phoneme. The chart in Figure 16 demonstrates that following the training the vowel space has become more clustered and no qualitative change has taken place.

EA exhibited attendance rate of 75%; however, the time devoted to homework practice was a total of 2h. The measurements show that although EA did not improve on the vowel duration, she managed to improve on the quality of vowels in citation words. The results of POSE test also showed an improvement in her perception of vowels.

Participant MZ

Durations of vowels

MZ	Before		After	
	Citation	Connected Speech	Citation	Connected Speech
Long	0.23	0.19	0.26	0.17
Short	0.11	0.11	0.13	0.12
Average	0.16	0.14	0.19	0.14
Ratio long:short	2.09 to 1	1.71 to 1	1.99 to 1	1.38 to 1

Table 8 MZ's vowel durations

Table 8 demonstrates that initially MZ exhibited a good long to short ratio in duration both in citation words and in connected speech. Following the training the long to short ratio remained native speaker comparable in citation words but worsened in connected speech. The POSE test (see Table 12, p 61) also shows that MZ has sometimes difficulties in differentiating vowel durations in connected speech. Minimal pair vowel duration values reveal that before the training MZ in most instances differentiates between long and short vowels: /i:/ in *sheep* 0.29 msec and /ɪ/ in *ship* 0.4 msec, /u:/ in *pool* 0.22 msec and /ʊ/ in pull 0.11 msec, /ɔ:/ in *port* 0.26 msec and /ɒ/ in *pot* 0.20 msec, /a:/ in *cart* 0.30 msec and /ʌ/ in *cut* 0.8 msec. Following the training the ratio in citation words remained good: /i:/ in *sheep* 0.27 msec and /ɪ/ in *ship* 0.5 msec, /u:/ in *pool* 0.23 msec and /ʊ/ in *pull* 0.17 msec, /ɔ:/ in *port* 0.38 msec and /ɒ/ in *pot* 0.10 msec, /a:/ in *cart* 0.32 msec and /ʌ/ in *cut* 0.10 msec. However, some vowels in words in connected speech were sometimes of either too long or too short duration, e.g.: /ɒ/ in *pots* 0.20 msec, /i:/ in *cheek* 0.10 msec. Long vowels in connected speech had a tendency to be shorter than the same words in citation words as in case of /i:/ in '*sheep'* in citation 0.26 msec and in connected speech 0.17 msec.

Vowel quality

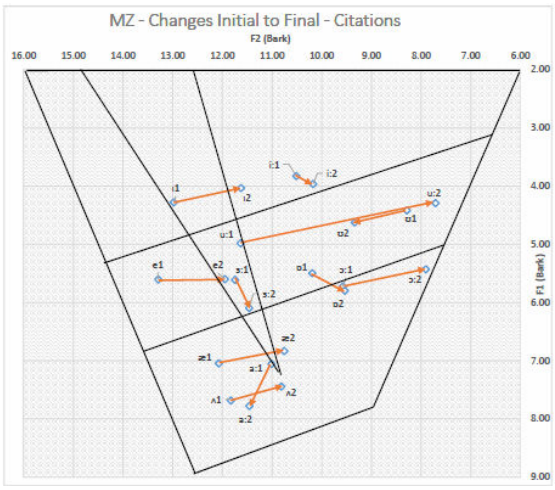

Figure 17. MZ's changes initial to final – citations

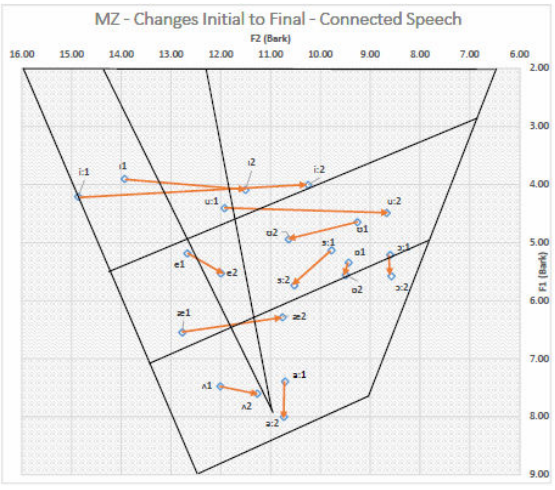

Figure18. MZ's changes initial to final – connected speech

The charts in Figures 17 and 18 demonstrate that MZ, although not always consistently, but differentiates qualitatively vowels /i:/ and /ɪ/, /u:/ and /ʊ/, /a:/ and /ʌ/. However, /ɔ:/ and /ɒ/ appear as allophones of one phoneme. The most difficult vowel for MZ was the low front /æ/, which she managed to produce well on some occasions during the training and in citation words, but which she confused with either /e/ or /ʌ/ in connected speech. The data in Figure 17 shows that following the training MZ's vowels tend to cluster in the centre of the quadrilateral in citation words, while in connected speech, as can me seen in Figure 18, all the vowels shift to backward position.

MZ exhibited attendance rate of 63% and the time devoted to homework practice was a total of 4h50min. The measurements show that MZ's improvement on the vowel quality was rather sporadic and the duration of vowels was native-like only in citation words. The results of POSE test also showed an improvement in her perception of vowels.

Participant SA

Durations of vowels

SA	Before		After	
	Citation	Connected Speech	Citation	Connected Speech
Long	0.188	0.13	0.21	0.137
Short	0.140	0.08	0.12	0.094

Average	0.161	0.10	0.16	0.110
Ratio long:short	1.34 to 1	1.58 to 1	1.82 to 1	1.46 to 1

Table 9 SA's vowel durations

Table 9 demonstrates that initially SA exhibited a good long to short ratio in connected speech (1.58 to 1). Following the training the long to short ratio improved in citation words from 1.34:1 to 1.82:1, but decreased slightly in connected speech from 1.58:1 to 1.46:1. The POSE test results (see Table 12, p 61) also show that SA has difficulties in differentiating vowel durations in connected speech. Minimal pair vowel duration values show that before the training SA is inconsistent in the differentiation of long and short vowels: /i:/ in *sheep* 0.9 msec and /ɪ/ in *ship* 0.8 msec, /u:/ in *pool* 0.15 msec and /ʊ/ in pull 0.4 msec, /ɔ:/ in s*ports* 0.15 msec and /ɒ/ in s*pots* 0.9 msec, /a:/ in *cart* 0.20 msec and /ʌ/ in *cut* 0.8 msec. In addition, 'oo' is always pronounced as long /u:/, e.g. in *book* it is 0.25 msec, *look* 0.25 msec, *food* 0.27 msec. Following the training the ratio in citation words improved and became more consistent: /i:/ in *sheep* 0.19 msec and /ɪ/ in *ship* 0.9 msec, /u:/ in *pool* 0.19 msec and /ʊ/ in *pull* 0.13 msec, /ɔ:/ in s*ports* 0.27 msec and /ɒ/ in s*pots* 0.25 msec, /a:/ in *cart* 0.29 msec and /ʌ/ in *cut* 0.9 msec. SA also improved in /u:/ and /ʊ/ differentiation: *book* 0.8 msec, *look* 0.5 msec, but *food* 0.27 msec. Long vowels in connected speech had a tendency to be shorter in citation words, as in case of /i:/ in *sheep* in citation 0.19 msec and in connected speech 0.16 msec, in *soon* in citations 0.24 msec and in connected speech 0.9 msec.

Vowel quality

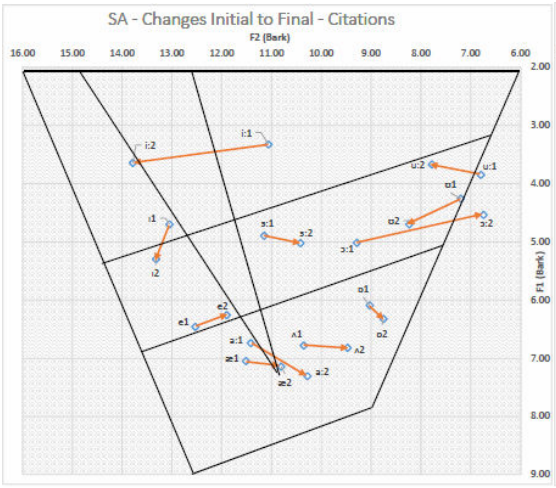

Figure 19. SA's changes initial to final – citations

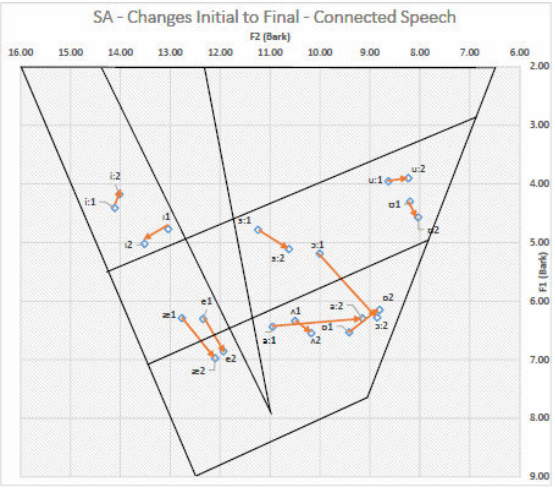

Figure 20. SA's changes initial to final – connected speech

The charts in Figures 19 and 20 illustrate that in citations SA differentiates vowels /iː/ and /ɪ/, /uː/ and /ʊ/, /ɔː/ and /ɒ/ qualitatively well. However, in connected speech /ɔː/ and /ɒ/ appear as allophones of one phoneme. SA managed to pronounce well low front /æ/ in citation words, but in connected speech /e/ and /æ/ remained allophones of one phoneme. The problem of correct production of low vowels /aː/ and /ʌ/ remained both in citations and in connected speech. In connected speech vowels appear to be better defined as separate phonemes than in connected speech where low and central vowels cluster in groups.

SA exhibited attendance rate of 44% and the time devoted to homework practice was a total of 1h10min. SA came to the course with a good level of English and her pronunciation was generally intelligible and clear. There were several aspects of vowel pronunciation which where identified as problematic and on which she improved well. The vowel measurements show that SA's improvement in the vowel duration was good in citations but she needed more training to make an improvement in connected speech. The improvements in quality were of a rather sporadic character. The results of the POSE test also showed an improvement in her perception of vowels.

3.5 Results and analysis of POSE test data

The participants performed the POSE test three times – before the course, one month into the course and at the end of the course. The results of the second round of testing were used to identify persisting perception problems and are not presented here. The materials used for diagnosing speech perception problems focused on vowels only. The test included two items for each vowel sound. 38 recorded sentences read by a British native speaker were played twice. The participants had to discriminate between long and short vowels, monophthongs and diphthongs, vowels similar in quality (e.g., /æ/ and /ɑ:/, /ɔ:/ and /ɒ/, /e/ and /æ/, /ʌ/ and /ə/, /ɪ/ and /ə/). The participants read the sentences (which came with illustrations) on paper while listening to the recordings. The test was conducted in a quiet room and no time constraint was set for performing this test.

Initial POSE test results

Table 10 presents the number and the type of mistakes each participant made during the first testing experiment. The results of the initial testing experiment identified the main problem areas participants had. The two final columns represent the number of correct answers out of total 38 tokens and the percentage of correct answers.

name	/e/-/æ/	/æ/-/ʌ/	/i:/-/ɪ/	/ʌ/-/ə/	/æ/-/ɒ/	/ʌ/-/ɒ/	/ʌ/-/ʊ/	/ɒ/-/əʊ/	/ɒ/-/a:/	/ɪ/-/e/	/eɪ/-/e/	/ɒ/-/ɔ:/	/ʊ/-/u:/	/ɔ:/-/ʌ/		%
AG	2		2		1		1	1	1						30/38	79
AL	1			1	1	2	1	1	2	1	1				27/38	71
AM	2			1	1	3			1		1		1		28/38	74
AS	2		1			3		1	2						29/38	76
EA	1		2		1	2	1	2	1	1					27/38	71
MZ	2		1		2	2			1				1		29/38	76
SA	1					2		1	1						33/38	87

Table 10. Initial POSE test results

The most problematic areas of perception were identified as the differentiation of: /e/ - /æ/ in pairs *pen* and *pan*, *pedal* and *paddle*, /æ/ - /ɒ/ in *rack* and *rock*, *sack* and

sock /ʌ/ - /ɒ/ in *boss* and *bus*, *collar* and *colour*, /ɒ/ - /əʊ/ in *ox* and *oaks*, *coat* and *cot'*/ɒ/ - /a:/ in *gods* and *guards*, *shock* and *shark*, /i:/ - /ɪ/ in *ship* and *sheep*. The issues related to non-differentiation of the vowels not present in the Russian vowel inventory, the duration of vowels and the diphthong recognition were expected to pose problems to the participants. Some of the mistakes, however, were made also due to the participants not knowing some words or not recognising them in a written form, e.g. *collar*, *putt*, *mace*, *ox*, etc.

This test was not repeated or analysed in class in order to avoid the learners remembering correct answers. However, nearly all the minimal pairs included in the test were worked on in different contexts (listening, speaking, drilling, etc) at the lessons.

Final POSE test results

Table 11 shows the number of correct answers and the percentage rate of correctness during the third testing experiment.

name	/e/-/æ/	/æ/-/ʌ/	/i:/-/ɪ/	/ʌ/-/ə/	/æ/-/ɒ/	/ʌ/-/ɒ/	/ʌ/-/ʊ/	/ɒ/-/əʊ/	/ɒ/-/a:/	/ɪ/-/e/	/eɪ/-/e/	/ɒ/-/ɔ:/	/ʊ/-/u:/	/ɔ:/-/ʌ/		%
AG												1	1		36/38	95
AL							1	1			1				35/38	92
AM					1		1								36/38	95
AS	1		1			1	1	1	1						32/38	84
EA	1			1			1	1							34/38	89
MZ	1		2			1	1	1							32/38	84
SA									1				1		36/38	95

Table 11. Final POSE test results

The results of each participant demonstrate general improvement in perception of different vowel features. There is a noticeable improvement in the differentiation of both the duration and the quality of vowels. However, some problems with the discrimination of monophthongs and diphthongs, as in *ox* and *oaks*, and some vowels, such as short /ɪ/ and /e/ as in *pin* and *pen* and /e/ and /æ/ as in *pen* and *pan* persisted. The results of the tests suggest that the discrimination of vowels based on their quality

requires more training since the participants failed to categorise the particular vowel sounds as separate entities and instead perceived them as the allophones of one phoneme.

	1st test		3rd test	
name	correct/total	%	correct/total	%
AG	30/38	79%	36/38	95%
AL	27/38	71%	35/38	92%
AM	28/38	74%	36/38	95%
AS	29/38	76%	32/38	84%
EA	27/38	71%	34/38	89%
MZ	29/38	76%	32/38	84%
SA	33/38	87%	36/38	95%

Table 12. Comparison of the results of the initial and the final tests.

The results of the tests presented in Table 12 show that the perception of certain features of vowels can be successfully trained and bear positive results. The question to consider in future is whether the input students receive should be broader and should include perception training of more than one variety of English.

3.6 Discussion of the results

The following objectives of the study were formulated and pursued. The aim of the research was to study the effect of training on the quantity and quality of the English vowels in the speech of the adult native speakers of Russian. The objectives were accomplished by devising and teaching a pronunciation enhancement course using a holistic approach where targeted pronunciation training was integrated into a general language course. Both quality and quantity of vowels was given a primary attention throughout the teaching process. The participants' progress was monitored; participants' utterances were recorded for further measurements and assessment at the beginning, during and after the course. The aimed objectivity of the measurements of the participants' recoded data was achieved by using Praat program.

The study confirmed and identified the following difficulties and problem areas of vowel pronunciation in English for the adult speakers of Russian: 1) qualitative non-differentiation in perception and production of vowel pairs /e/ and /æ/, /u:/ and /ʊ/, /ɔ:/ and /ɒ/, /i:/ and /ɪ/; 2) confusion of low vowels /æ/, /ʌ/, /a:/ and /ɒ/; 3) backward vowel shift (e.g., /i:/ shift from front to central position); 4) non-differentiation of vowel durations.

The reasons for these problems in pronunciation could be several: negative transfer from L1, a lack of previous phonological input, and insufficient pronunciation learning skills. Firstly, the negative transfer from L1, which stands as a primary reason for the phonological mistakes in the participants' speech, can explain the non-differentiation of vowel quality, vowel durations and the backward shift of vowels in participants' speech. For example, English vowels /i:/ and /e/ do not cause the palatalisation of the preceding consonant, while in Russian these two vowels always do. Following the explanation and practice in class the problem of non-palatalisation of preceding consonants by /i:/ and /e/ was associated with the vowels becoming more central and sounding more like Russian /ɨ/ (i.e. /ы/). The problem area of qualitative and quantitative non-differentiation of vowels is directly linked to the transfer from L1.

Secondly, it is worth noting that training pronunciation requires particular skills both from the teacher and from the student. The learner should be provided a detailed guidance in both training the perception and production side of pronunciation. In addition to face-to-face pronunciation training, learners need to be taught how to work with and what to look for while working with recorded materials and online or paper dictionaries. For example, when looking up the pronunciation of a word they should know which features are of primary importance and that they should be able to notice them (stress, vowel duration, pitch, quality of vowels, etc).

Finally, it was surprising to discover that certain fundamental features of English reading and pronunciation had never been taught to the participants prior to the course. For example, certain cases of silent letter (as 'k' in *know*, *knee*, or 'b' in *dumb*, *comb*, etc), digraphs and trigraphs ('oa' as in *goat*, or 'ow' in *snow* and *owl*), qualitative distinction of /i:/ and /ɪ/, /u:/ and /ʊ/, /ɔ:/ and /ɒ/ were new concepts for them.

Since every participant differed from the other representatives of the group (by age, linguistic abilities, language learning skills and years of learning English), it is rather difficult to make generalisations with regard to the overall improvements of the group. The results of the measurements display high variability; nevertheless, several conclusions can be drawn based on the results. The POSE test revealed that every participant improved in their perception of English vowels. The results of acoustic measurements show that several participants learnt to better differentiate English vowels based on the duration and several learnt to differentiate based on the quality. Participants AM and AS displayed an improvement of the vowel durations both in citations and in connected speech. MZ and SA displayed improvement of the vowel durations in citations only. Participants AL and AM improved in vowel quality in citations and connected speech, EA improved in citations only. MZ and SA also made a few changes but they were of rather sporadic nature.

It could have been expected that the participants who reported themselves as bilingual in Russian and Estonian (AG, AL and AM) would all have improved in duration, since Estonian has three-way phonemic vowel contrast. The results, however, show no correlation between Estonian-Russian bilingualism of the participants and hence the ability to differentiate English vowels quantitatively. The same can be noted about the vowel quality. There are more vowels in Estonian (nine) than in Russian (six)

but the improvements in quality were made by both monolingual as well as bilingual participants.

Every participant mentioned the motivation factor, citing it as a means to enhance their pronunciation. However, participation rate in classes and the number of hours spent on homework and revision varied across the group. The best results – identified through the measurements of vowel quality and duration ratios and by the POSE test – were demonstrated by AM, who had the best rate of attendance and dedicated the highest number of hours to out-of-class training. Other participants improved as well but to a lesser extent.

Finally, a number of limitations of the study need to be considered. First, the present study is based on a small sample of participants. Secondly, the participants displayed uneven participation and homework completion rate. Thirdly, the time allocated for training may have not been long enough to trigger changes to the participants' pronunciation. Nevertheless, notwithstanding these limitations, the study suggests that pronunciation can be addressed in the context of a general language course and that – provided enough targeted input – adult learners can change and improve their pronunciation and their perception of spoken English. Further studies on the current topic of segmental phonology could be recommended. A similar course of the same or longer duration concentrating on various aspects of phonology could be taught in a different linguistic environment, with other source and target languages. More research could be done to investigate different approaches, methods and techniques to enhance the perception and the production of segments for non-native speakers of English. The data of the participants' speech obtained within the framework of the current thesis were analysed acoustically. It would be fascinating to test learners' speech further with the help of other modern technology available today, such as an electropalatograph and/or

electromagnetic palatograph (systems which measure and register the contact of the tongue and the palate during speech articulation). It could also be very interesting to study various features of accent in bilingual and multilingual learners and study the variations and/or consistent patterns in their accents.

CONCLUSIONS

The present thesis focuses on linguistic and pedagogical aspect of English pronunciation training imparted to adult native speakers of Russian. The linguistic aspect is reflected in recording and identifying the pronunciation problems of Russian L1 speakers (common problems of duration and quality), comparing the differences between the native speaker and the learners' values before and after the training, identifying the changes that took place following the short training course and understanding their nature. The results of the research show that the major problem areas common to the participants were the pronunciation of front and low vowels, and the discrimination of vowel durations. While at the end of the training every participant was recorded to have improved in the perception of vowel quality and durations, only some of the subjects recorded positive changes in the categorisation of vowels by quality and quantity.

As the vehicle that allowed the participants to achieve these improvements was the course they received, the effect of the teaching on the participants' pronunciation of vowels should also be assessed. From the teaching point of view the course provided an excellent opportunity to test a holistic approach in pronunciation teaching and to try out various methods and techniques. According to the feedback from the participants the approach proved successful, as they stated that they enjoyed the targeted pronunciation instruction integrated into a general language class. Some of them admitted that even if they may not have improved much in pronunciation during the course, they had become more aware of certain features in their accent and also learnt essential techniques on how to work on improving their pronunciation independently. It can be stated that the

course was too short and thus insufficient to lead to profound changes of the quality of vowel pronunciation in all participants. On the other hand it should also be considered that the effort that the participants invested in the course was highly variable across the group and more practice could have possibly had more impact on the final results. It can be stated that more motivated learners and in particular those who invested the most time in learning and pronunciation practice demonstrated the most noticeable improvements. However, there were learners who made efforts but still did not improve. To conclude, in the pronunciation teaching and pronunciation learning process the rate of success for both parties involved appears to depend on the following essential factors: a good balance of the amount of input and practice, motivation, and the teacher's and learners' linguistic abilities and skills.

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APPENDIX 1 Pronunciation enhancement course outline

Intensive course for adult learners of English with focus on vowel pronunciation training

Course length: 8 weeks, twice per week, lesson length 1,5 hours (32 academic hours)

Week 1	Course introduction; Listening test, reading and speaking recordings. Student questionnaire, setting individual study plans. Letters and sounds: vowels, diphthongs Introduction to phonemic symbols - IPA Exploring the quality of English vowels. Mouth, tongue positioning. **Topics and vocabulary**: travelling, countries (toponyms)
Week 2	Letters and sounds: vowels and diphthongs, consonants. Pitch, length, loudness of stressed vowels. Short and long vowels Phonemic spelling. Orthographic spelling. **Topics and vocabulary**: holidays, means of transport, places
Week 3	Letters and sounds: schwa practice of pitch, length, loudness of stressed vowels vowel quality minimal pair practice **Topics and vocabulary**: traveller's stories, booking, requesting travel information
Week 4	Revision Diphthongs Long vowels with ‚r' homonyms Test 1 listening and reading, speaking repeated. Analysis. **Topics and vocabulary**: hotel vocabulary, describing itinerary
Week 5	Schwa Silent letters, silent e and i, long vowels with ‚r' Diphthongs ad monophthongs Short and long vowels **Topics and vocabulary**: travel announcements, information „The Monkey as King" listening and pronunciation training
Week 6	Monophthongs and diphthongs **Topics and vocabulary**: „The Monkey as King" listening and pronunciation training „Fox in Socks" Dr Seuss – reading/pronunciation, listening practice.
Week 7	Revision Monophthongs and diphthongs Orthographic and phonemic spelling Stressed/instressed vowels, schwa **Topics and vocabulary**: travel essentials, travel guidebooks, travel advice.
Week 8	Revision and evaluation. One-to-one lesson with each student. Listening and reading/speaking test.

APPENDIX 2 List of teaching materials used in the course

1) Hancock, M. 2003. *English Pronuncition in Use.*Cambridge University Press

Units 2, 4, 6, 7, 11, 14, 16, 18, 19, 20, D1 pp 130–133

2) Hancock, M, 1996. *Pronunciation Games.* Cambridge University Press;

Pp 23, 35, 37, 50-51, 53, 54, 56, 57, 59, 65, 67, 88–89

3) Bowler, Bill, 2005. *Timesaver Pronunciation Activities.* Scholastic. Mary Glasgow Magazines

Pp 14–15, 24–27, 30–31, 34–35, 46, 48, 50–51

4) McGowen, Bruce and Vic Richardson, 2000. *Clockwise. Pre-intermedite.* Oxford University Press

Units 5–7

APPENDIX 3 List of recording materials

First and second round of recording materials

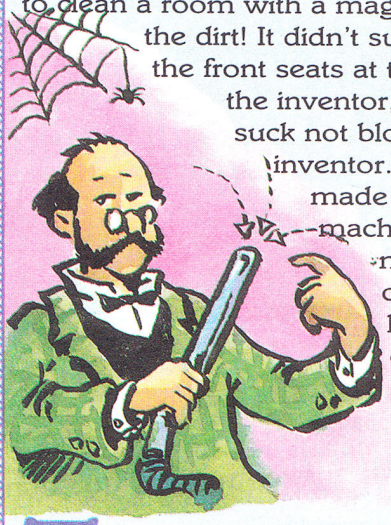
Test 1 – words and sentences

ship	cut	pitch	look	learn	sign
pool	fool	pen	wet	soon	knife
spots	port	had	will	lap	UK
has	an	food	won	seed	our
hers	peach	hat	war	where	old
sheep	full	bus	what	don't	pain
pull	pot	head	lucky	white	ear
bed	earn	book	dirty	sure	hair
sports	cart	eight	alert	here	one
heart	coin	voice	kit	loud	Saudi Arabia

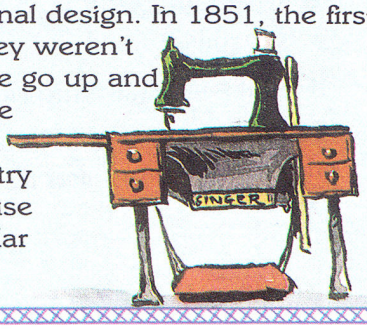
1. Where is that ship?
2. I don't like sports.
3. I have got two buns.
4. Can I have some white beans? Sure, here you are.
5. Does that sign say „pull"?
6. Look, is that your sister?
7. That heart is big and red.
8. I like Spanish pots.
9. She has spots on her skin.
10. Sally has cut her finger with a knife.
11. The football pitch is wet.
12. Teachers don't earn much.
13. My coffee cup is full.
14. We will reach London soon.
15. Can we get to Hendon by bus?
16. He has lots of friends in the UK.
17. England won the rugby match.
18. Ron caught a big cod fish.
19. A box of matches costs ten cents.
20. Our landlord lives here.
21. Yemen is south of Saudi Arabia.
22. I have pain in my ear.
23. I need to have a haircut.
24. This one is an old coin. It is from the eighth century.
25. My voice is louder than hers.

Test 2 – reading a short text

The man who invented this useful machine was called Hubert Cecil Booth. But the idea wasn't completely original. In 1901, Mr Booth saw a show at the theatre in which the 'real' inventor showed how to clean a room with a magic machine. The only problem was that it blew the dirt! It didn't suck it up. It just moved it around. Everyone in the front seats at the theatre started sneezing! Booth spoke to the inventor, 'Your machine is wonderful, but it should suck not blow.' 'That's not possible!' said the angry inventor. 'Yes, it is,' said Booth and he went away and made a simple change to the design. He made a machine which sucked the dirt into a bag, and he made his fortune. The most famous name connected with this machine is not Booth, however. In Britain, it is Hoover, the name of one of the first companies to manufacture these machines, and we even use the name as a verb. We often say 'I'm just going to hoover the floor,' when we go to the cupboard to get out the _____ .



The most famous name connected with this useful machine is Singer. Isaac Singer did not invent the first machine of this type but he thought of an improvement to the original design. In 1851, the first Singer _____ machines were sold. They weren't electric, then, of course. You made the needle go up and down by moving a 'pedal' with your foot. The pedal moved wheels which were connected with the needle. The Singer factory in Coventry later also made bicycles and then cars because the mechanism of the wheels was very similar in all these machines.



Test 3 – perception of spoken English (POSE)

List of sentences where participants had to disambiguate a vowel of the minimal pair.

1. They had to pedal/paddle the boat.
2. Don't slip/sleep on the deck.
3. Mr. Green was beaten/bitten.
4. Shirley enjoyed looking at the buds/birds.
5. That's my sack/sock.
6. Kevin ran after the boss/buss.
7. He was hurt when he hit the rock/rack.
8. Look at that sheep/ship.
9. I need a cop/cup.
10. That cot/coat is too small.
11. Jeremy putts/puts the golf ball.
12. This pen/pan leaks.
13. There was a lock/lark on the box.
14. Where is the letter/ladder?
15. Will you please pick up that litter/letter for me?
16. He slept under the ox/oaks.
17. The gods/guards were angry.
18. Look at the gull/girl.
19. Jacob took good care of his axe/ox.
20. I don't like the collar/colour.
21. I'd like to sail/sell the boat.
22. Steve needed two bucks/books.
23. The men/man will be here soon.
24. It was a big shock/shark.
25. How did you like my fox/folks?
26. He hailed/held the cab for me.
27. Put that chair in the shade/shed.
28. He looked at the mace/mess on the floor.
29. They are picking/pecking the fruit.
30. The spaghetti sauce is bitter/better.
31. He sat on his cat/cot.
32. The sign says, "Pull"/"Pool."
33. Look at that cot/cart.
34. Look at that soot/suit!
35. I need a pin/pen for the message.
36. You must heat/hit it.
37. Doug caught/cut the fish.
38. Look at the clock/cloak.

Third round of recording materials

Test 1 – words

swarm	full	pitch	head	sad	beer	sure	hers	tongue	National Rail Enquiries
ship	pen	pool	book	won	alert	here	sheep	back	double ensuite
hotel	heart	had	cheek	war	kit	sign	beetle	spots	moisturiser
food	torch	one	look	what	learn	knife	knit	has	Saudi Arabia
warm	cut	old	wet	comb	soon	UK	honest	bag	building
bottle	fool	coin	ghost	near	lap	our	half	London	Iceland
bed	port	eight	hat	knock	seed	tin	chick	had	temperature
sports	pot	voice	will	lucky	where	pain	pull	answer	Zimbabwe
an	earn	loud	sir	dirty	don’t	ear	hat	poodle	Edinburgh
peach	cart	bus	sat	live	white	hair	teen	paddle	biscuit

Third round of recording materials

Test 1 – sentences

1. Where is that sheep?
2. I don't like sports.
3. I have got two buns.
4. Can I have some white tins? Sure, here you are.
5. Does that sign say „pool"?
6. Look, is that your big sister?
7. That heart is big and red.
8. I like Spanish pots.
9. She has spots on her skin.
10. Sally has cut her finger with a knife.
11. The football pitch is wet.
12. Teachers learn while teaching.
13. My coffee cup is full.
14. We will reach Edinburgh soon.
15. Can we get to Paddington by bus?
16. He has lots of friends in the USA.
17. England won the football match.
18. Ron caught a big cod fish.
19. A box of matches costs ten cents.
20. Our landlord lives here.
21. Yemen is south of Saudi Arabia.
22. I have pain in my ear. And I have a stomack ache. Oh, poor us!
23. I need to have a haircut.
24. This one is an old coin. It is from the eighth century.
25. My voice is louder than hers.
26. She was combing her hair when a bomb killed her pet lamb and she hurt her thumb.
27. He knew she was knitting when he took his knife and knocked on the door.
28. Who can write the whole sentence?
29. To be honest, I've never seen a ghost eat spaghetti.
30. I guess I left my guitar and my biscuits in the building.
31. Listen! Someone is whistling a Christmas carol in the castle.
32. I wore a suit to see my friend in the fruit business.
33. The rain in Spain falls mainly on the plain.
34. The fat cat sat on the man's black hat.
35. Steve keeps the cheese in the freezer.
36. It's best to rest, said the vet to the pet.
37. I ate an apple and a banana in a cinema in Canada.
38. Alex's lettuces tasted like cabbages.
39. Frank found four frogs laughing on the floor.
40. Vera drove to Venice in a van.
41. Tim bit a bit of Kitty's biscuits.
42. Nile crocodiles have the wildest smiles.
43. Rose knows Joe phones Sophie, but Sophie and Joe don't know Rose knows.
44. John wants Walter wash the dog.
45. My mother and father live together with my other brother.

APPENDIX 4 Subjects' profiles

The following table lists the learner profiles of the participants.

The names contain two letters which stand for the initials of the participants.

name	age	mother tongue	second language/ bilingual in	years studies English	other languages studied	uses English
AG	22	Russian	Estonian	13	German, Korean, Czech	reads books and scholarly articles in English, frequently watches TV and films in English, speaks English frequently but mostly with non-native speakers
AL	19	Russian	Estonian	9		watches TV shows and films in English with subtitles, attends a specialist course in English at the university read by an English NS.
AM	38	Russian	Estonian	1	German, Finnish	self-study, reading, speaking English with foreigners occasionally, watches TV shows and films
AS	38	Russian	Hebrew	5	Estonian, French, Korean, Spanish	speaks English on a daily basis, reads and writes in English frequently, watches TV shows and films in English
MZ	36	Russian	Hebrew	6	Estonian	speaks English on a daily basis, reads and writes in English sometimes, watches TV shows and films in English
EA	20	Russian		9	Polish	speaks English with NNS at the university on some occasions, watches films in English sometimes
SA	22	Russian		10	Estonian, Latin, Polish	reads books and scholarly articles in English, watches TV and films in English frequently, speaks English frequently but mostly with NNS,

Table 13. Subjects' profiles

APPENDIX 5 Participants' vowel values (tables and plots)

Organisation of Appendix 5

The vowels' average data recorded for each participant before and after the course are presented in this section. For each participant there are two sheets; one contains the data for citation words before and after the course while the other sheet shows the same data but for connected speech. Each sheet contains three tables and three charts. Each chart is generated by the data of the table above. The first table and the first chart on the left are the data from Deterding's (1997) study on English monophthongs; this table and the chart are provided as a reference point to help compare the data of a participant against the average native speaker one. The two other tables and charts contain the average vowel values of the participant before and after the training. On each chart the author has superimposed the vowel quadrilateral to help the reader to recognise the spatial position of the vowels and to analyse the movements.

AG – Vowel Quality before/after vs. Native Speaker (citations)

	F1 (Bark)	F2 (Bark)
iː	3.10	15.03
ɪ	4.14	13.98
e	5.95	13.96
æ	8.58	12.26
ʌ	7.24	10.84
ɑː	6.99	9.60
ɒ	5.60	8.47
ɔː	4.13	7.13
ʊ	3.97	9.72
uː	3.29	10.72
ɜː	5.99	11.60

Table 1. Average female values of F1 and F2 in Bark in citation words by Deterding (1997)

	F1 (Bark)	F2 (Bark)	F3 (Bark)
iː	3.18	14.89	16.79
ɪ	3.85	13.90	15.12
e	7.04	11.97	13.38
æ	7.62	12.65	14.32
ʌ	7.66	10.98	13.88
ɑː	7.17	10.15	12.99
ɒ	5.86	8.23	13.54
ɔː	5.65	8.87	12.82
ʊ	4.06	8.57	14.43
uː	3.86	9.10	14.48
ɜː	5.74	12.20	14.43

Table 14. AG's average values of F1 and F2 in Bark in citation words before training

	F1 (Bark)	F2 (Bark)	F3 (Bark)
iː	4.00	13.44	16.34
ɪ	4.17	13.81	14.97
e	6.96	12.10	14.63
æ	7.06	11.82	14.08
ʌ	7.39	10.30	13.39
ɑː	5.75	8.27	13.33
ɒ	6.42	8.54	13.58
ɔː	5.48	9.16	13.43
ʊ	4.24	9.73	14.63
uː	4.00	8.40	14.54
ɜː	5.76	12.23	14.43

Table 15. AG's average values of F1 and F2 in Bark in citation words after training

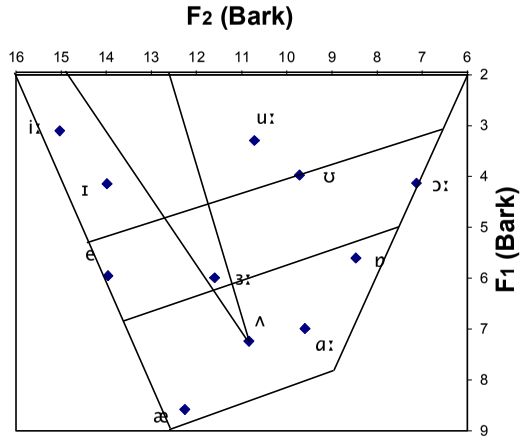


Figure 4. F1/F2 for average native female speaker in citation words (Detterding 1997)

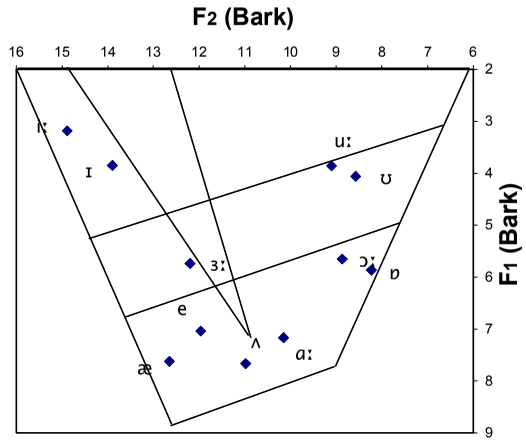


Figure 21. F1/F2 for AG in citation words before training

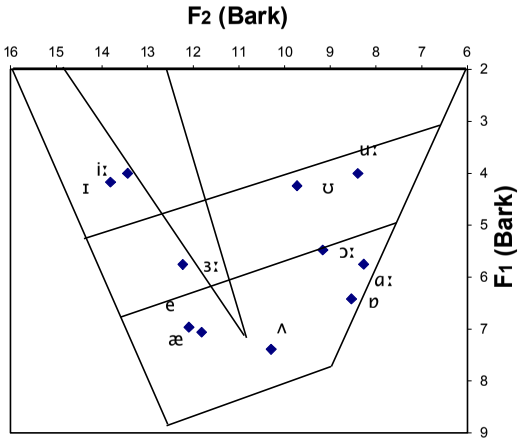


Figure 22. F1/F2 for AG in citation words after training

AG – Vowel Quality before/after vs. Native Speaker (connected speech)

	F1 (Bark)	F2 (Bark)
iː	2.950	14.870
ɪ	3.700	13.640
e	6.530	13.300
æ	8.620	12.410
ʌ	7.940	11.010
ɑː	7.920	10.320
ɒ	6.780	9.780
ɔː	3.750	7.770
ʊ	3.940	10.440
uː	3.180	10.910
ɜː	5.630	12.020

Table 2. Average female values of F1 and F2 in Bark in connected speech words by Deterding (1997)

	F1 (Bark)	F2 (Bark)	F3 (Bark)
iː	3.36	13.94	16.32
ɪ	3.87	14.48	15.42
e	7.10	11.83	13.64
æ	6.69	11.68	13.67
ʌ	6.78	10.15	13.43
ɑː	6.84	11.19	13.19
ɒ	6.52	9.15	13.54
ɔː	5.90	8.79	12.92
ʊ	4.23	9.13	14.81
uː	3.91	9.66	14.63
ɜː	5.45	12.11	14.00

Table 16. AG's average values of F1 and F2 in Bark in connected speech words before training

	F1 (Bark)	F2 (Bark)	F3 (Bark)
iː	3.12	9.14	14.96
ɪ	4.14	13.73	14.78
e	7.12	12.29	14.50
æ	6.91	12.36	14.84
ʌ	7.06	10.02	13.05
ɑː	6.73	11.13	13.77
ɒ	6.06	8.76	13.35
ɔː	6.13	9.56	14.02
ʊ	4.21	10.32	14.86
uː	4.22	10.90	14.91
ɜː	5.64	12.12	14.30

Table 17. AG's average values of F1 and F2 in Bark in connected speech words after training

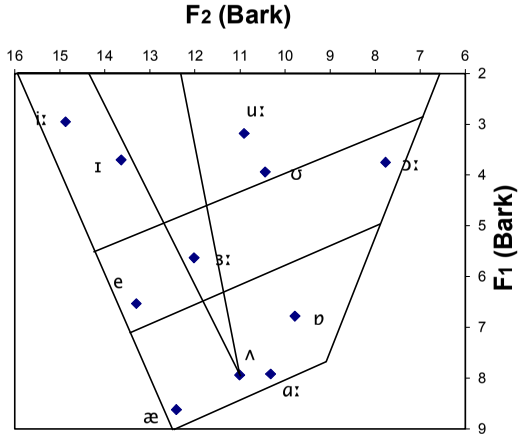


Figure 6. F1/F2 for average native female speaker in connected speech words (Detterding 1997)

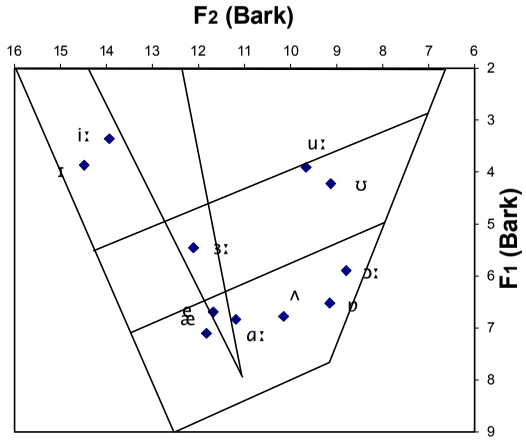


Figure 23. F1/F2 for AG in connected speech words before training

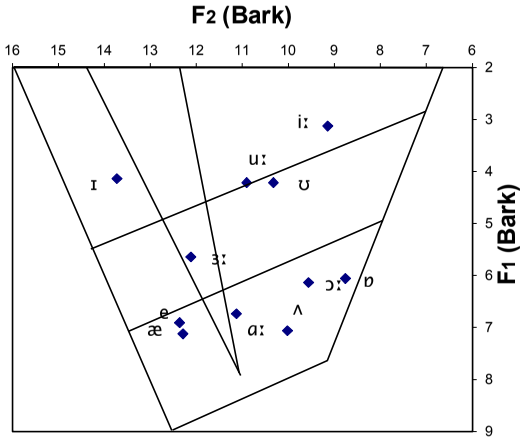


Figure 24. F1/F2 for AG in connected speech words after training

AL – Vowel Quality before/after vs. Native Speaker (citations)

	F1 (Bark)	F2 (Bark)
iː	3.10	15.03
ɪ	4.14	13.98
e	5.95	13.96
æ	8.58	12.26
ʌ	7.24	10.84
ɑː	6.99	9.60
ɒ	5.60	8.47
ɔː	4.13	7.13
ʊ	3.97	9.72
uː	3.29	10.72
ɜː	5.99	11.60

Table 1. Average female values of F1 and F2 in Bark in citation words by Deterding (1997)

	F1 (Bark)	F2 (Bark)	F3 (Bark)
iː	4.39	14.94	15.81
ɪ	4.64	14.18	15.89
e	6.39	12.99	15.85
æ	7.58	12.47	15.44
ʌ	7.10	9.89	14.45
ɑː	7.48	10.39	15.34
ɒ	4.78	8.30	15.27
ɔː	4.75	7.87	15.30
ʊ	4.39	7.68	14.24
uː	4.40	7.87	14.48
ɜː	5.71	10.40	14.55

Table 18. AL's average values of F1 and F2 in Bark in citation words before training

	F1 (Bark)	F2 (Bark)	F3 (Bark)
iː	4.11	14.84	16.56
ɪ	4.25	14.61	15.65
e	5.88	12.77	15.24
æ	6.42	12.14	14.87
ʌ	6.43	11.31	14.38
ɑː	5.46	9.64	14.86
ɒ	5.17	8.84	14.34
ɔː	4.50	6.92	15.09
ʊ	4.47	7.40	14.53
uː	4.57	10.02	15.61
ɜː	4.72	11.58	15.41

Table 19. AL's average values of F1 and F2 in Bark in citation words after training

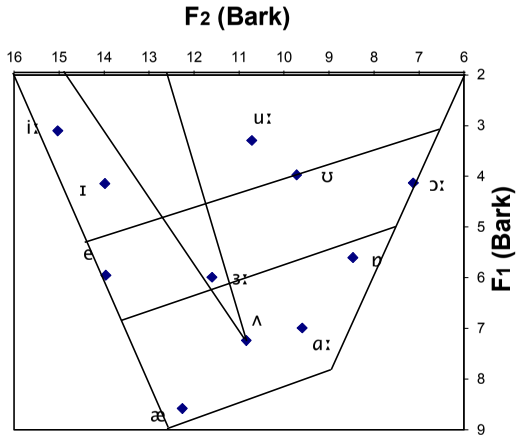


Figure 4. F1/F2 for average native female speaker in citation words (Detterding 1997)

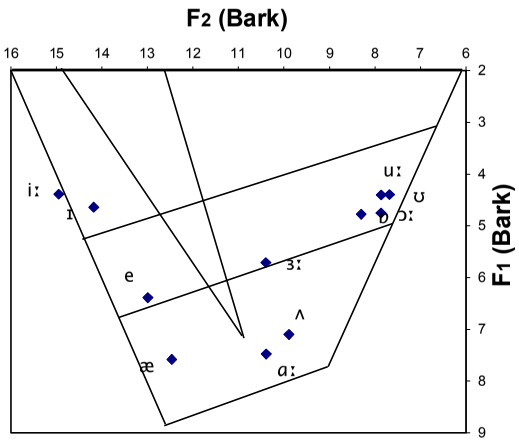


Figure 25. F1/F2 for AL in citation words before training

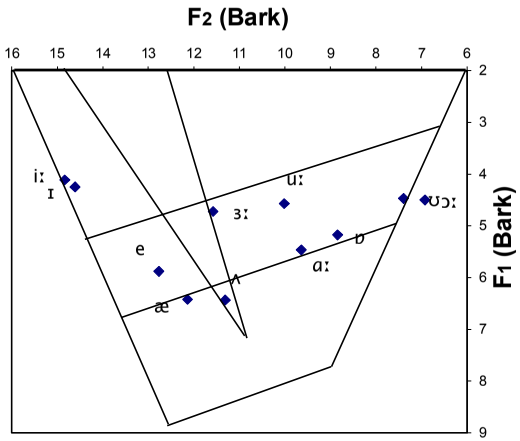


Figure 26. F1/F2 for AL in citation words after training

AL – Vowel Quality before/after vs. Native Speaker (connected speech)

	F1 (Bark)	F2 (Bark)
iː	2.950	14.870
ɪ	3.700	13.640
e	6.530	13.300
æ	8.620	12.410
ʌ	7.940	11.010
ɑː	7.920	10.320
ɒ	6.780	9.780
ɔː	3.750	7.770
ʊ	3.940	10.440
uː	3.180	10.910
ɜː	5.630	12.020

Table 2. Average female values of F1 and F2 in Bark in connected speech words by Deterding (1997)

	F1 (Bark)	F2 (Bark)	F3 (Bark)
iː	4.67	14.23	15.57
ɪ	4.36	14.36	15.75
e	5.74	12.58	15.19
æ	6.17	12.78	15.58
ʌ	6.66	9.51	14.44
ɑː	6.46	10.15	14.65
ɒ	4.78	8.14	14.82
ɔː	4.71	7.57	14.34
ʊ	4.61	7.45	14.83
uː	4.19	9.14	14.63
ɜː	5.01	9.85	14.14

Table 20. AL's average values of F1 and F2 in Bark in connected speech words before training

	F1 (Bark)	F2 (Bark)	F3 (Bark)
iː	3.93	12.24	15.71
ɪ	3.84	13.36	15.33
e	5.47	12.63	15.61
æ	6.05	12.65	14.92
ʌ	6.21	10.53	14.58
ɑː	6.67	10.03	14.66
ɒ	4.80	9.20	14.08
ɔː	4.38	7.10	14.56
ʊ	4.16	8.18	14.31
uː	4.38	11.30	15.28
ɜː	5.13	9.46	14.52

Table 21. AL's average values of F1 and F2 in Bark in connected speech words after training

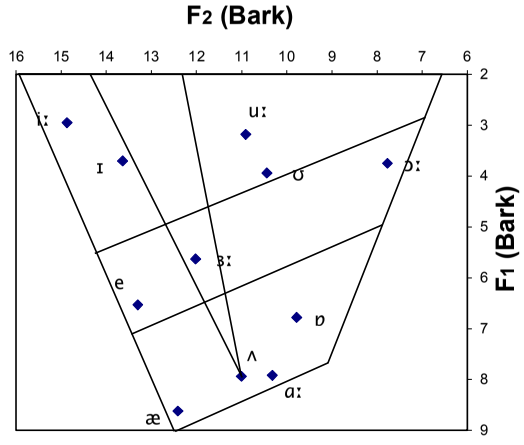


Figure 6. F1/F2 for average native female speaker in connected speech words (Detterding 1997)

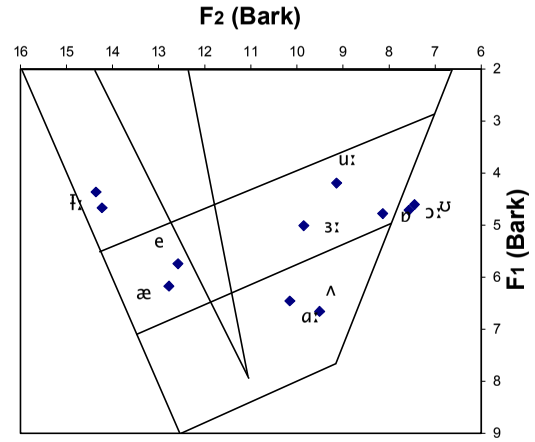


Figure 27. F1/F2 for AL in connected speech words before training

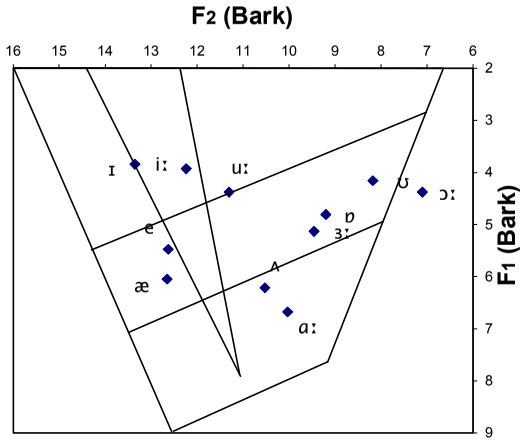


Figure 28. F1/F2 for AL in connected speech words after training

AM – Vowel Quality before/after vs. NS (citations)

	F1 (Bark)	F2 (Bark)
iː	3.10	15.03
ɪ	4.14	13.98
e	5.95	13.96
æ	8.58	12.26
ʌ	7.24	10.84
ɑː	6.99	9.60
ɒ	5.60	8.47
ɔː	4.13	7.13
ʊ	3.97	9.72
uː	3.29	10.72
ɜː	5.99	11.60

Table 1. Average female values of F1 and F2 in Bark in citation words by Deterding (1997)

	F1 (Bark)	F2 (Bark)	F3 (Bark)
iː	4.05	13.47	15.69
ɪ	4.18	12.20	14.63
e	6.54	10.96	13.96
æ	7.13	11.13	13.55
ʌ	7.20	10.49	12.51
ɑː	6.99	9.08	13.77
ɒ	6.01	8.76	13.03
ɔː	4.80	7.12	14.19
ʊ	4.58	9.37	14.80
uː	4.19	8.63	13.63
ɜː	6.68	12.08	13.60

Table 22. AM's average values of F1 and F2 in Bark in citation words before training

	F1 (Bark)	F2 (Bark)	F3 (Bark)
iː	3.96	14.21	16.08
ɪ	4.62	13.62	15.20
e	7.52	12.10	14.38
æ	8.30	12.14	14.39
ʌ	7.56	10.57	13.84
ɑː	6.56	9.44	13.51
ɒ	6.91	10.25	14.61
ɔː	4.39	6.13	14.37
ʊ	4.80	9.41	14.80
uː	4.29	9.87	14.42
ɜː	5.72	11.35	14.54

Table 23. AM's average values of F1 and F2 in Bark in citation words after training

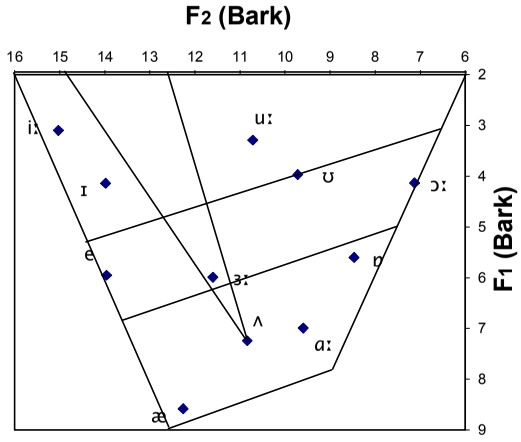


Figure 4. F1/F2 for average native female speaker in citation words (Detterding 1997)

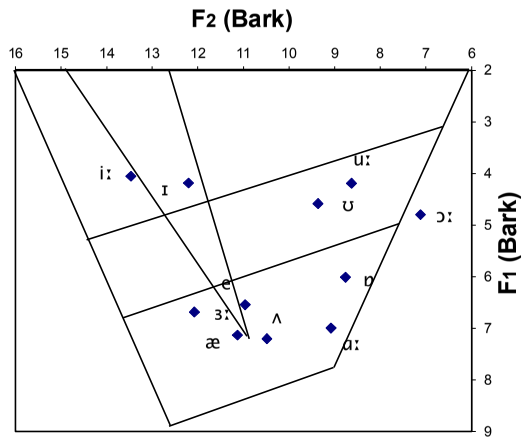


Figure 29. F1/F2 for AM in citation words before training

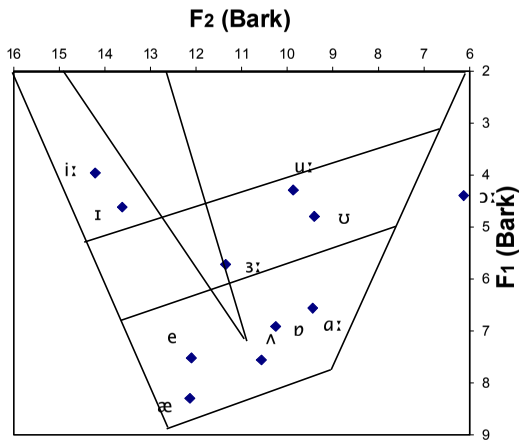


Figure 30. F1/F2 for AM in citation words after training

AM – Vowel Quality before/after vs. NS (connected speech)

	F1 (Bark)	F2 (Bark)
iː	2.95	14.87
ɪ	3.70	13.64
e	6.53	13.30
æ	8.62	12.41
ʌ	7.94	11.01
ɑː	7.92	10.32
ɒ	6.78	9.78
ɔː	3.75	7.77
ʊ	3.94	10.44
uː	3.18	10.91
ɜː	5.63	12.02

Table 2. Average female values of F1 and F2 in Bark in connected speech words by Deterding (1997)

	F1 (Bark)	F2 (Bark)	F3 (Bark)
iː	3.72	10.74	15.42
ɪ	4.24	12.67	14.67
e	6.44	11.71	13.13
æ	5.81	10.92	14.33
ʌ	6.76	10.44	13.43
ɑː	7.35	10.62	12.39
ɒ	5.78	8.56	13.11
ɔː	5.36	7.06	13.49
ʊ	4.37	9.88	14.35
uː	4.48	10.20	14.91
ɜː	6.19	11.73	13.72

Table 24. AM's average values of F1 and F2 in Bark in connected speech words before training

	F1 (Bark)	F2 (Bark)	F3 (Bark)
iː	3.77	11.20	15.56
ɪ	4.47	14.28	15.16
e	6.85	10.95	14.30
æ	7.07	11.35	13.96
ʌ	8.07	10.64	14.75
ɑː	6.99	9.99	14.24
ɒ	5.81	9.35	15.02
ɔː	4.99	7.76	14.33
ʊ	3.90	8.93	14.70
uː	4.20	9.82	14.84
ɜː	5.84	11.42	14.24

Table 25. AM's average values of F1 and F2 in Bark in connected speech words after training

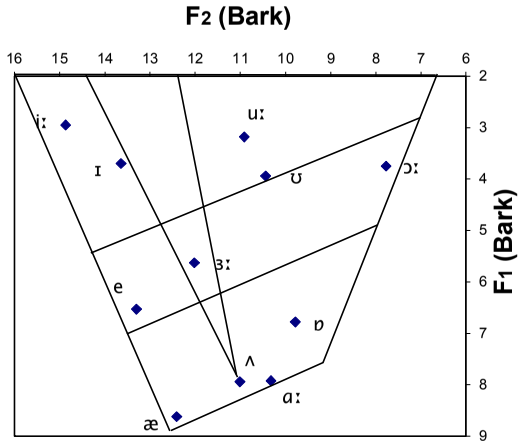


Figure 6. F1/F2 for average native female speaker in connected speech words (Detterding 1997)

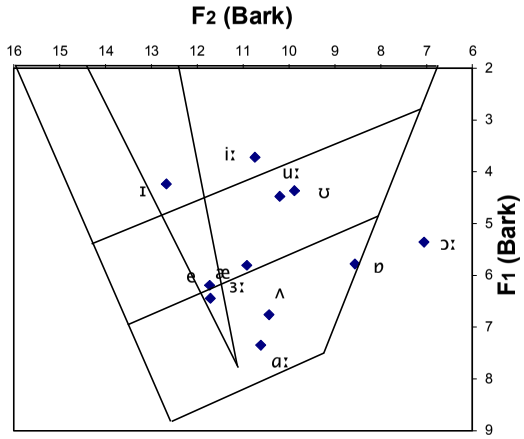


Figure 31. F1/F2 for AM in connected speech words before training

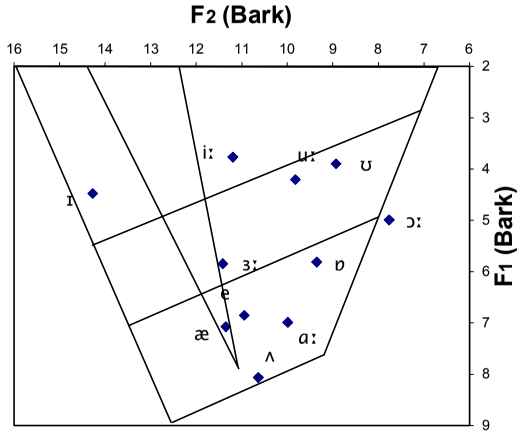


Figure 32. F1/F2 for AM in connected speech words after training

AS – Vowel Quality before/after vs. Native Speaker (citations)

	F1 (Bark)	F2 (Bark)
iː	3.10	15.03
ɪ	4.14	13.98
e	5.95	13.96
æ	8.58	12.26
ʌ	7.24	10.84
ɑː	6.99	9.60
ɒ	5.60	8.47
ɔː	4.13	7.13
ʊ	3.97	9.72
uː	3.29	10.72
ɜː	5.99	11.60

Table 1. Average female values of F1 and F2 in Bark in citation words by Deterding (1997)

	F1 (Bark)	F2 (Bark)	F3 (Bark)
iː	3.35	13.34	15.90
ɪ	3.29	15.04	16.02
e	6.66	13.46	15.46
æ	7.82	12.44	15.10
ʌ	7.75	11.48	15.17
ɑː	7.66	10.30	13.55
ɒ	5.81	8.92	14.12
ɔː	4.94	8.39	14.60
ʊ	3.80	7.71	14.24
uː	3.46	8.33	13.97
ɜː	5.70	12.75	15.31

Table 26. AS's average values of F1 and F2 in Bark in citation words before training

	F1 (Bark)	F2 (Bark)	F3 (Bark)
iː	4.01	14.96	16.12
ɪ	4.31	14.19	16.02
e	6.41	12.33	15.05
æ	7.40	11.12	13.91
ʌ	6.43	11.36	13.86
ɑː	7.08	9.76	14.60
ɒ	5.13	7.23	13.07
ɔː	4.19	7.96	14.14
ʊ	4.56	9.11	15.26
uː	3.80	8.22	15.19
ɜː	5.60	12.53	15.14

Table 27. AS's average values of F1 and F2 in Bark in citation words after training

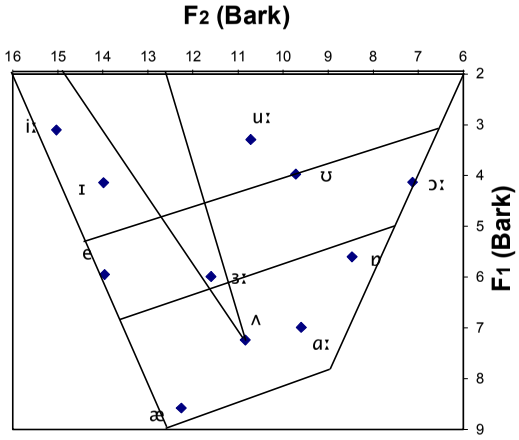


Figure 4. F1/F2 for average native female speaker in citation words (Detterding 1997)

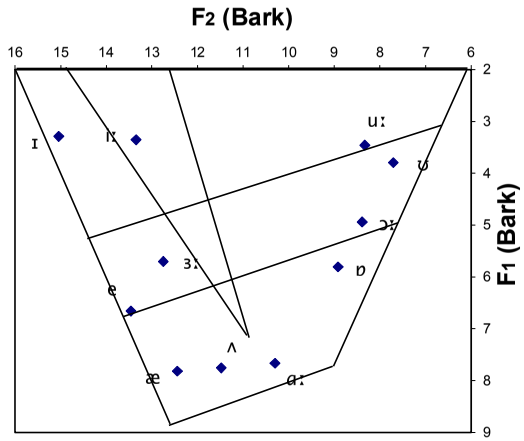


Figure 33. F1/F2 for AS in citation words before training

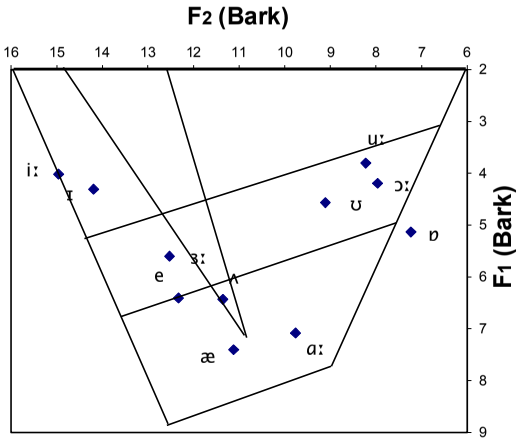


Figure 34. F1/F2 for AS in citation words after training

AS – Vowel Quality before/after vs. Native Speaker (connected speech)

	F1 (Bark)	F2 (Bark)
iː	2.950	14.870
ɪ	3.700	13.640
e	6.530	13.300
æ	8.620	12.410
ʌ	7.940	11.010
ɑː	7.920	10.320
ɒ	6.780	9.780
ɔː	3.750	7.770
ʊ	3.940	10.440
uː	3.180	10.910
ɜː	5.630	12.020

Table 2. Average female values of F1 and F2 in Bark in connected speech words by Deterding (1997)

	F1 (Bark)	F2 (Bark)	F3 (Bark)
iː	3.90	15.18	15.82
ɪ	3.65	14.39	16.02
e	6.67	13.48	15.86
æ	7.37	12.03	14.60
ʌ	8.19	11.20	14.56
ɑː	7.09	9.65	13.02
ɒ	5.33	8.36	14.44
ɔː	4.78	8.65	15.25
ʊ	4.70	8.37	14.82
uː	3.70	9.27	14.24
ɜː	5.08	11.63	15.09

Table 28. AS's average values of F1 and F2 in Bark in connected speech words before training

	F1 (Bark)	F2 (Bark)	F3 (Bark)
iː	4.00	14.12	15.95
ɪ	4.22	14.17	16.16
e	6.02	12.10	14.72
æ	6.95	11.40	14.36
ʌ	6.83	9.91	13.53
ɑː	7.09	9.65	13.02
ɒ	5.12	8.45	13.90
ɔː	5.24	8.60	15.60
ʊ	4.43	9.40	14.90
uː	4.43	9.59	15.94
ɜː	4.71	11.72	15.17

Table 29. AS's average values of F1 and F2 in Bark in connected speech words after training

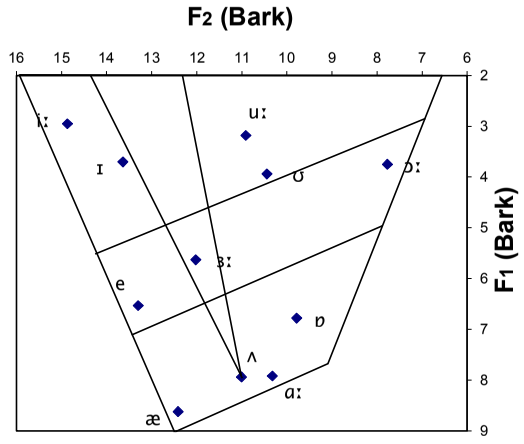


Figure 6. F1/F2 for average native female speaker in connected speech words (Detterding 1997)

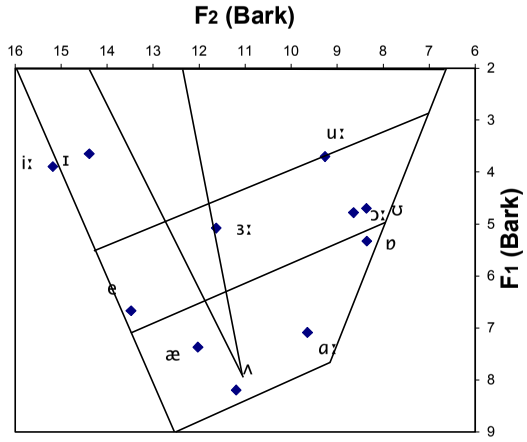


Figure 35. F1/F2 for AS in connected speech words before training

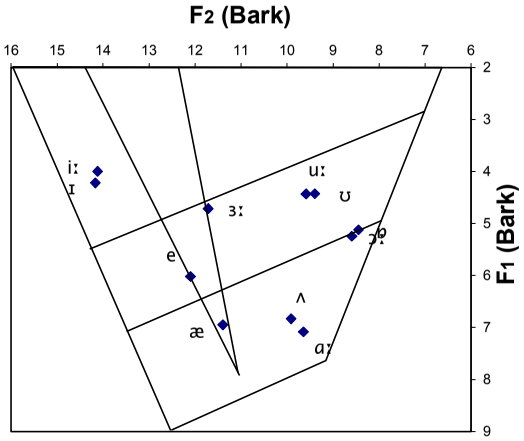


Figure 36. F1/F2 for AS in connected speech words after training

EA – Vowel Quality before/after vs. Native Speaker (citations)

	F1 (Bark)	F2 (Bark)
iː	3.10	15.03
ɪ	4.14	13.98
e	5.95	13.96
æ	8.58	12.26
ʌ	7.24	10.84
ɑː	6.99	9.60
ɒ	5.60	8.47
ɔː	4.13	7.13
ʊ	3.97	9.72
uː	3.29	10.72
ɜː	5.99	11.60

Table 1. Average female values of F1 and F2 in Bark in citation words by Deterding (1997)

	F1 (Bark)	F2 (Bark)	F3 (Bark)
iː	3.48	13.98	16.01
ɪ	3.80	14.12	15.95
e	6.47	12.68	14.79
æ	7.02	11.74	14.34
ʌ	7.13	11.38	14.01
ɑː	6.77	12.40	14.85
ɒ	5.07	7.90	14.33
ɔː	5.16	7.27	13.75
ʊ	4.09	7.97	14.35
uː	3.92	7.68	13.96
ɜː	5.63	11.02	14.12

Table 30. EA's average values of F1 and F2 in Bark in citation words before training

	F1 (Bark)	F2 (Bark)	F3 (Bark)
iː	2.91	12.15	15.75
ɪ	3.70	11.11	15.43
e	6.69	12.49	15.38
æ	7.42	12.06	15.02
ʌ	6.81	11.22	14.92
ɑː	7.84	10.67	14.61
ɒ	6.65	9.76	13.74
ɔː	5.34	8.17	14.48
ʊ	4.63	9.81	14.83
uː	3.81	9.12	14.90
ɜː	5.86	11.74	14.52

Table 31. EA's average values of F1 and F2 in Bark in citation words after training

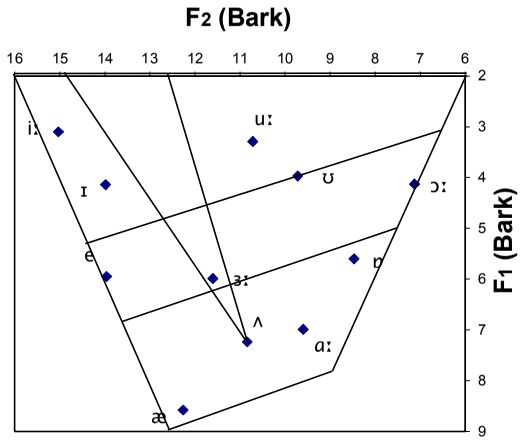


Figure 4. F1/F2 for average native female speaker in citation words (Detterding 1997)

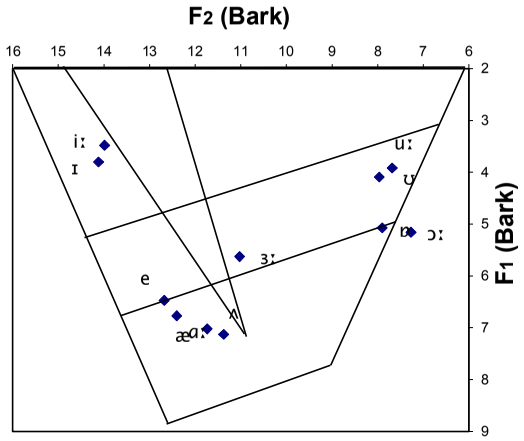


Figure 37. F1/F2 for EA in citation words before training

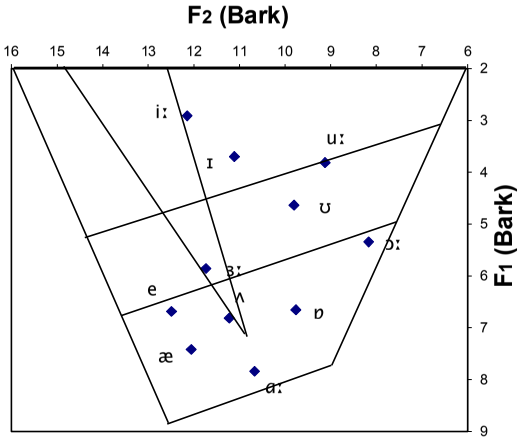


Figure 38. F1/F2 for EA in citation words after training

EA – Vowel Quality before/after vs. Native Speaker (connected speech)

	F1 (Bark)	F2 (Bark)
iː	2.950	14.870
ɪ	3.700	13.640
e	6.530	13.300
æ	8.620	12.410
ʌ	7.940	11.010
ɑː	7.920	10.320
ɒ	6.780	9.780
ɔː	3.750	7.770
ʊ	3.940	10.440
uː	3.180	10.910
ɜː	5.630	12.020

Table 2. Average female values of F1 and F2 in Bark in connected speech words by Deterding (1997)

	F1 (Bark)	F2 (Bark)	F3 (Bark)
iː	3.13	12.28	15.77
ɪ	3.87	13.25	15.59
e	6.29	12.93	15.21
æ	6.25	12.33	14.94
ʌ	7.21	12.00	14.62
ɑː			
ɒ	5.19	9.18	14.69
ɔː	4.76	8.77	14.10
ʊ	4.15	7.58	13.53
uː	3.89	10.08	14.41
ɜː	5.82	12.41	14.27

Table 32. EA's average values of F1 and F2 in Bark in connected speech words before training

	F1 (Bark)	F2 (Bark)	F3 (Bark)
iː	3.34	11.88	16.04
ɪ	3.01	9.95	15.40
e	6.68	12.38	15.43
æ	6.19	10.91	13.63
ʌ	7.50	11.58	14.32
ɑː	6.07	10.44	13.43
ɒ	5.94	9.79	15.35
ɔː	5.47	8.82	15.01
ʊ	4.17	8.99	14.63
uː	3.66	9.30	14.89
ɜː	5.29	11.07	13.38

Table 33. EA's average values of F1 and F2 in Bark in connected speech words after training

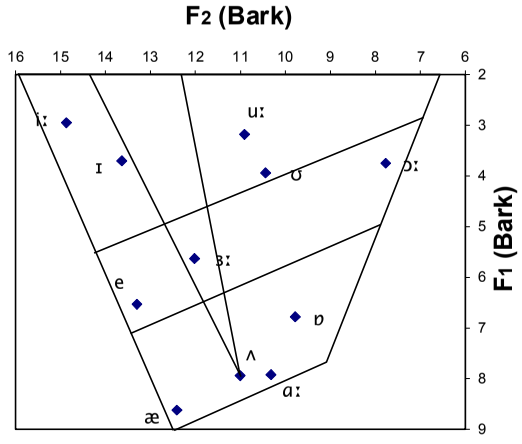


Figure 6. F1/F2 for average native female speaker in connected speech words (Detterding 1997)

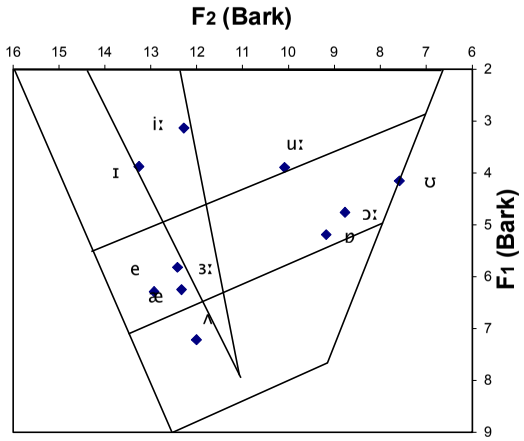


Figure 39. F1/F2 for EA in connected speech words before training

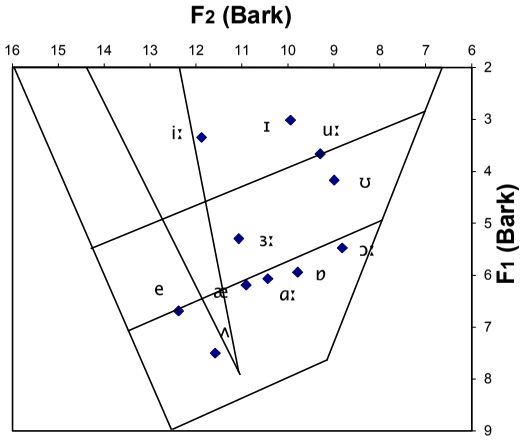


Figure 40. F1/F2 for EA in connected speech words after training

MZ – Vowel Quality before/after vs. Native Speaker (citations)

	F1 (Bark)	F2 (Bark)
iː	3.10	15.03
ɪ	4.14	13.98
e	5.95	13.96
æ	8.58	12.26
ʌ	7.24	10.84
ɑː	6.99	9.60
ɒ	5.60	8.47
ɔː	4.13	7.13
ʊ	3.97	9.72
uː	3.29	10.72
ɜː	5.99	11.60

Table 1. Average female values of F1 and F2 in Bark in citation words by Deterding (1997)

	F1 (Bark)	F2 (Bark)	F3 (Bark)
iː	3.83	10.51	15.96
ɪ	4.28	12.98	15.55
e	5.60	13.29	15.12
æ	7.05	12.07	14.96
ʌ	7.68	11.83	15.13
ɑː	7.05	11.01	14.95
ɒ	5.50	10.19	15.19
ɔː	5.72	9.58	15.14
ʊ	4.42	8.29	14.54
uː	4.98	11.63	15.18
ɜː	5.61	11.75	15.00

Table 34. MZ's average values of F1 and F2 in Bark in citation words before training

	F1 (Bark)	F2 (Bark)	F3 (Bark)
iː	3.96	10.18	15.42
ɪ	4.03	11.62	15.46
e	5.60	11.95	14.03
æ	6.83	10.75	13.79
ʌ	7.44	10.81	14.36
ɑː	7.78	11.46	14.86
ɒ	5.80	9.54	14.71
ɔː	5.43	7.91	14.06
ʊ	4.62	9.34	14.62
uː	4.29	7.71	13.87
ɜː	6.09	11.46	14.24

Table 35. MZ's average values of F1 and F2 in Bark in citation words after training

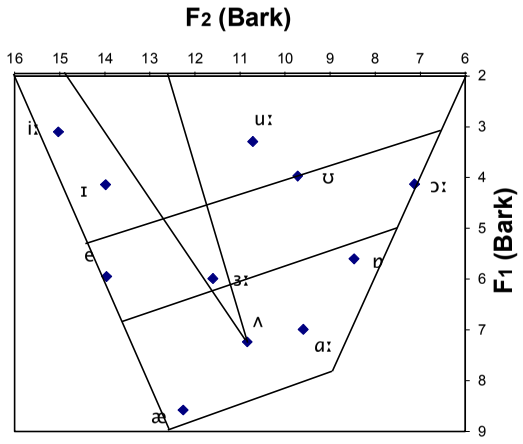


Figure 4. F1/F2 for average native female speaker in citation words (Detterding 1997)

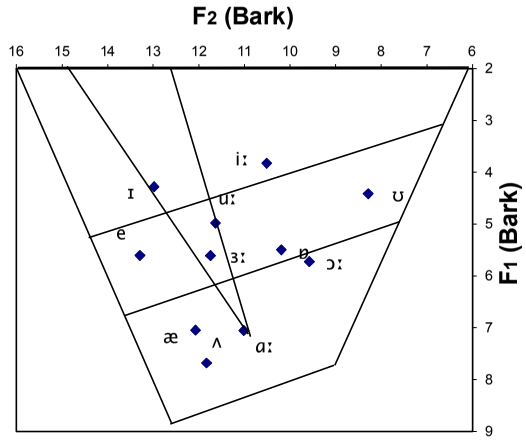


Figure 41. F1/F2 for MZ in citation words before training

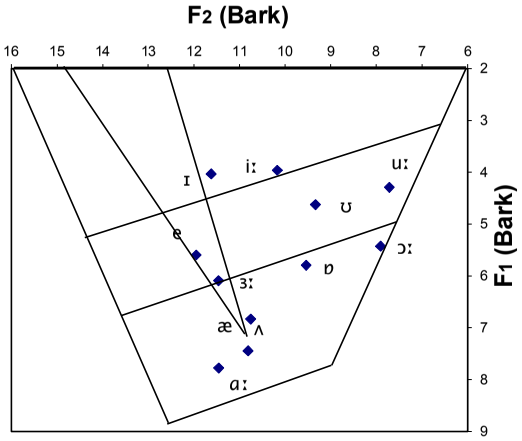


Figure 42. F1/F2 for MZ in citation words after training

MZ – Vowel Quality before/after vs. Native Speaker (connected speech)

	F1 (Bark)	F2 (Bark)
iː	2.950	14.870
ɪ	3.700	13.640
e	6.530	13.300
æ	8.620	12.410
ʌ	7.940	11.010
ɑː	7.920	10.320
ɒ	6.780	9.780
ɔː	3.750	7.770
ʊ	3.940	10.440
uː	3.180	10.910
ɜː	5.630	12.020

Table 2. Average female values of F1 and F2 in Bark in connected speech words by Deterding (1997)

	F1 (Bark)	F2 (Bark)	F3 (Bark)
iː	4.21	14.87	15.83
ɪ	3.90	13.93	15.74
e	5.19	12.67	14.08
æ	6.55	12.77	15.28
ʌ	7.48	12.01	15.28
ɑː	7.40	10.71	15.26
ɒ	5.34	9.43	15.28
ɔː	5.21	8.60	14.27
ʊ	4.65	9.26	14.70
uː	4.41	11.93	16.15
ɜː	5.13	9.78	14.54

Table 36. MZ's average values of F1 and F2 in Bark in connected speech words before training

	F1 (Bark)	F2 (Bark)	F3 (Bark)
iː	4.01	10.25	15.29
ɪ	4.09	11.50	15.59
e	5.53	12.00	14.01
æ	6.29	10.76	13.57
ʌ	7.60	11.27	14.67
ɑː	8.01	10.73	14.84
ɒ	5.56	9.49	14.71
ɔː	5.58	8.57	14.01
ʊ	4.94	10.64	15.13
uː	4.49	8.67	13.87
ɜː	5.74	10.52	13.65

Table 37. MZ's average values of F1 and F2 in Bark in connected speech words after training

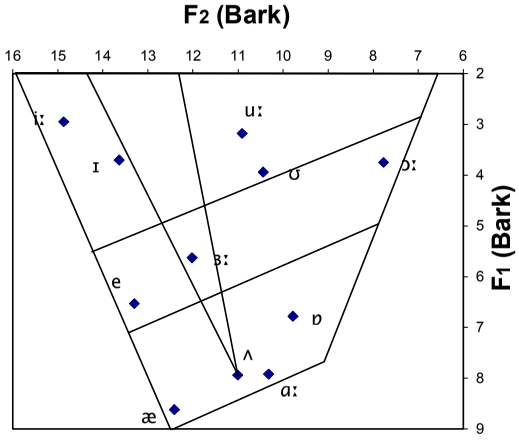


Figure 6. F1/F2 for average native female speaker in connected speech words (Detterding 1997)

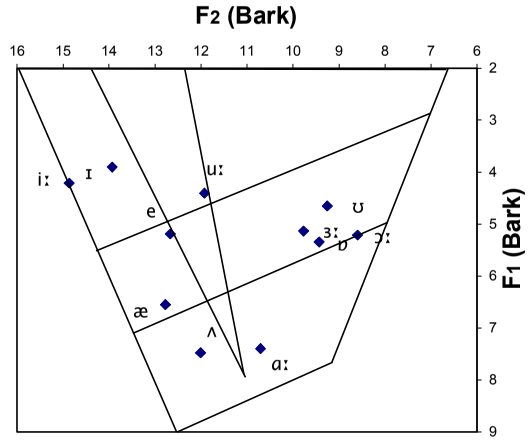


Figure 43. F1/F2 for MZ in connected speech words before training

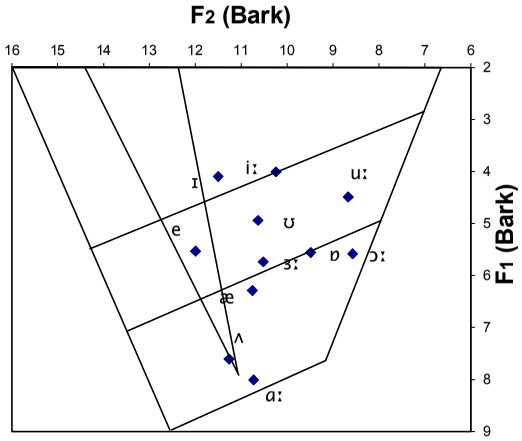


Figure 44. F1/F2 for MZ in connected speech words after training

SA – Vowel Quality before/after vs. Native Speaker (citations)

	F1 (Bark)	F2 (Bark)
iː	3.10	15.03
ɪ	4.14	13.98
e	5.95	13.96
æ	8.58	12.26
ʌ	7.24	10.84
ɑː	6.99	9.60
ɒ	5.60	8.47
ɔː	4.13	7.13
ʊ	3.97	9.72
uː	3.29	10.72
ɜː	5.99	11.60

Table 1. Average female values of F1 and F2 in Bark in citation words by Deterding (1997)

	F1 (Bark)	F2 (Bark)	F3 (Bark)
iː	3.33	11.06	15.22
ɪ	4.70	13.05	15.15
e	6.46	12.53	15.07
æ	7.05	11.51	14.41
ʌ	6.78	10.35	14.40
ɑː	6.74	11.42	13.26
ɒ	6.09	9.03	15.65
ɔː	5.02	9.29	14.25
ʊ	4.26	7.20	14.19
uː	3.85	6.79	14.15
ɜː	4.90	11.15	12.93

Table 38. SA's average values of F1 and F2 in Bark in citation words before training

	F1 (Bark)	F2 (Bark)	F3 (Bark)
iː	3.64	13.79	15.75
ɪ	5.30	13.32	15.51
e	6.26	11.90	14.16
æ	7.15	10.81	14.37
ʌ	6.82	9.47	14.10
ɑː	7.31	10.28	15.67
ɒ	6.33	8.75	14.18
ɔː	4.54	6.74	14.55
ʊ	4.70	8.23	15.32
uː	3.67	7.78	13.74
ɜː	5.02	10.42	12.43

Table 39. SA's average values of F1 and F2 in Bark in citation words after training

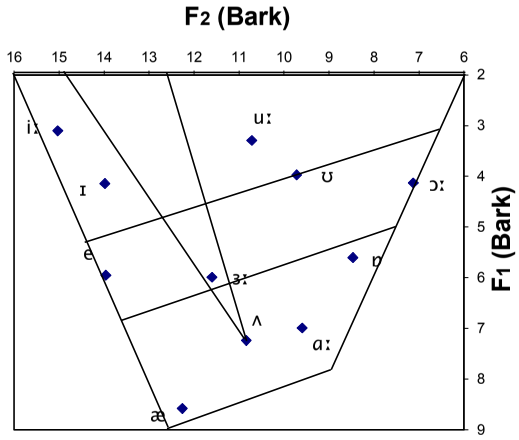


Figure 4. F1/F2 for average native female speaker in citation words (Detterding 1997)

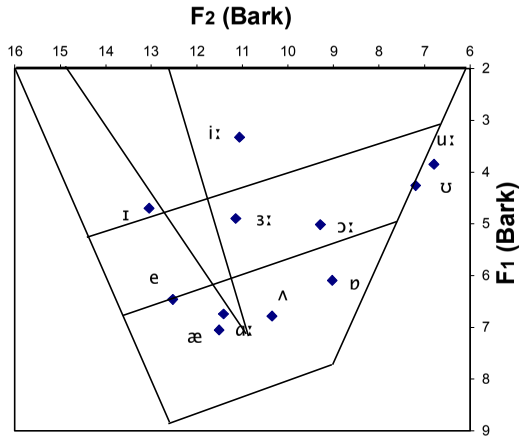


Figure 45. F1/F2 for SA in citation words before training

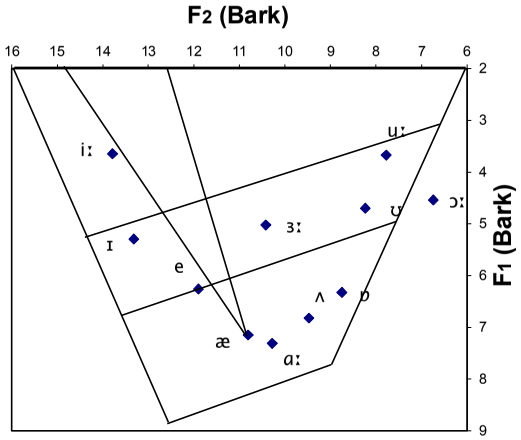


Figure 46. F1/F2 for SA in citation words after training

SA – Vowel Quality before/after vs. Native Speaker (connected speech)

	F1 (Bark)	F2 (Bark)
iː	2.950	14.870
ɪ	3.700	13.640
e	6.530	13.300
æ	8.620	12.410
ʌ	7.940	11.010
ɑː	7.920	10.320
ɒ	6.780	9.780
ɔː	3.750	7.770
ʊ	3.940	10.440
uː	3.180	10.910
ɜː	5.630	12.020

Table 2. Average female values of F1 and F2 in Bark in connected speech words by Deterding (1997)

	F1 (Bark)	F2 (Bark)	F3 (Bark)
iː	4.41	14.11	15.22
ɪ	4.77	13.04	14.91
e	6.30	12.34	14.19
æ	6.29	12.77	15.52
ʌ	6.34	10.50	14.88
ɑː	6.44	10.95	13.08
ɒ	6.53	9.41	14.66
ɔː	5.19	10.01	14.24
ʊ	4.30	8.20	14.95
uː	3.95	8.63	14.36
ɜː	4.78	11.24	13.28

Table 40. SA's average values of F1 and F2 in Bark in connected speech words before training

	F1 (Bark)	F2 (Bark)	F3 (Bark)
iː	4.18	14.02	16.00
ɪ	5.02	13.52	15.65
e	6.86	11.93	14.36
æ	6.97	12.10	14.16
ʌ	6.54	10.17	15.92
ɑː	6.29	9.15	13.50
ɒ	6.15	8.81	15.02
ɔː	6.28	8.85	15.36
ʊ	4.57	8.03	13.89
uː	3.90	8.23	14.13
ɜː	5.11	10.62	12.82

Table 41. SA's average values of F1 and F2 in Bark in connected speech words after training

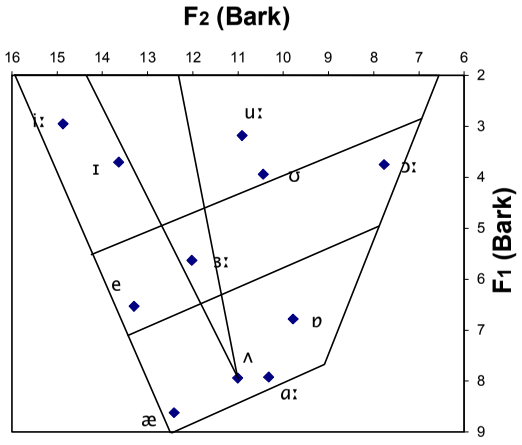


Figure 6. F1/F2 for average native female speaker in connected speech words (Detterding 1997)

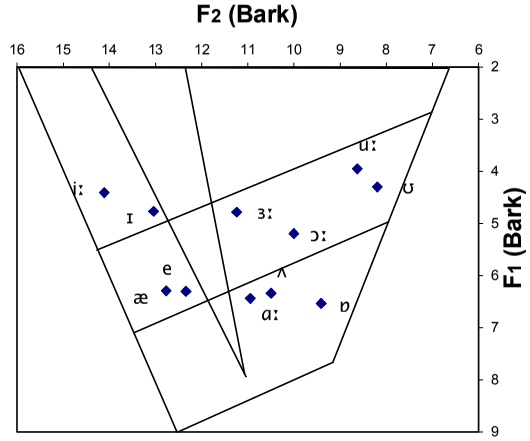


Figure 47. F1/F2 for SA in connected speech words before training

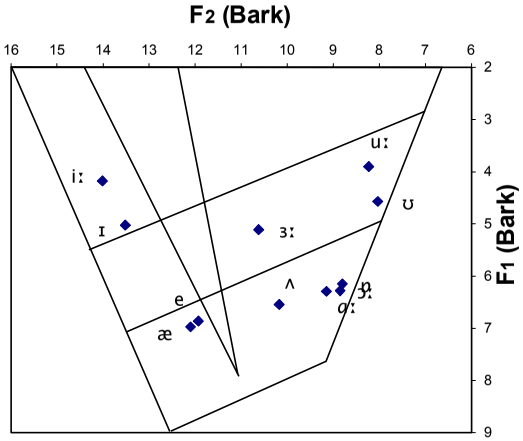


Figure 48. F1/F2 for SA in connected speech words after training

RESÜMEE

TARTU ÜLIKOOL
INGLISE FILOLOOGIA OSAKOND

Jekaterina Desjatnikova

The Effect of Training on the Quality and Quantity of English Vowels in Adult Native Russian Speakers / Vene keelt emakeelena kõnelevate täiskäsvanud õppijatele korraldatud hääldustreeningu mõju nende inglise keele vokaalide kvaliteedile ja kvantiteedile

Magistritöö
2016
Lehekülgede arv: 96

Annotatsioon:

Käesolev uurimus vaatleb vene keelt emakeelena kõnelevatele täiskasvanud õppijatele korraldatud häälduskursuse mõju nende inglise keele vokaalide kvantiteedile ja kvaliteedile. Uurimus sisaldas lühikest intensiivkursust, milles hääldus õpetamine toimus osana üldisest keeleõppest ning moodustas 50% kogu õppetööst. Hääldus õpetamist käsitleti analüütilis-lingvistilise ja integreeritud lähenemise varal, mis näeb hääldust keele õppimise ja keeles suhtlemise lahutamatu ja olulist tähendust omava komponendina. Kursusel osales seitse katseisikut. Selleks, et hinnata ja tuvastada muutusi vokaalide hääldamisel, pidid osalejad enne ja pärast häälduskursust sooritama rea teste, mis sisaldasid häälikuerinevuste tajumise ja kõne mõistmise ülesandeid. Kõne mõistmise ülesandes pidid osalejad lugema etteantud sõnu, lauseid ja lühiteksti. Lugemisülesannete salvestuste analüüs näitas, et osalejate inglise keele tajus ja ingliskeelses kõnes toimusid kursuse järgselt muutused, kuid need ei olnud grupis ühtlased. Hääldustreeningu positiivne mõju vokaalide tajumisele ilmnes kõigi osalejate puhul. Samas treeningu mõju kõnele oli ebaühtlane. Osal õppijatest paranes vokaalide kestus ja osal kvaliteet. Statistiliselt näitasid klassiõppetöös osalenute ja koduülesandeid täitnute seas parimaid tulemusi need, kes olid tugevasti motiveeritud ja võtsid aktiivselt osa õppetööst. Kuigi häälduskursus oli tõhus inglise keele hääldus teatud aspektide parema teadvustamise saavutamisel, mis ilmnes ka tajutestide tulemustest, on ilmne, et põhjalike kõnemuutuste toimumiseks oleks kursus pidanud olema pikem.

Töö koosneb kolmest osast: 1. peatükk esitab teoreetilise tausta võõrkeeleõppe häälduse gа seotud aspektide osas; 2. peatükk sisaldab inglise ja vene keelte fonoloogiliste süsteemide kontrastiivset lühianalüüsi; 3. peatükk kirjeldab läbi viidud

empiirilist uurimust, sh häältdustreeningu protseduuri, andmete kogumismeetodit, salvestuste põhjal saadud tulemusi ja nende analüüsist tehtud järeldusi. Peatükkidele järgneb kokkuvõte, milles tuuakse välja uurimuse tulemuste põhjal tehtud üldised järeldused.

Märksõnad: inglise keel kui võõrkeel, häältdustreening, inglise keele vokaalide kvaliteet ja kvantiteet, täiskasvanud õppijad

Lihtlitsents lõputöö reprodutseerimiseks ja üldsusele kättesaadavaks tegemiseks

Mina, Jekaterina Desjatnikova,

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THE EFFECTS OF TRAINING ON THE QUALITY AND QUANTITY OF ENGLISH VOWELS IN ADULT NATIVE RUSSIAN SPEAKERS

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Tartus, 20.05.2016

Jekaterina Desjatnikova