

FOREIGN LANGUAGE TEACHING:
A comparison of performance of Finnish 6th and 9th
graders

Bachelor's thesis
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<p>Tiivistelmä – Abstract</p> <p>Tieto foneemisten aakkosten hallinnan tasosta on olennaista, koska suullinen viestintä on tärkeässä osassa Perusopetuksen opetussuunnitelman perusteissa 2004 ja koska foneemisiin aakkosiin perustuvan opetusmetodin on todettu korjaavan väärinkäsityksiä kielen lausumisessa. Aiempi tutkimus on keskittynyt tutkimaan, millaiset ääntämisongelmat ovat tyypillisiä suomalaisille ja kuinka erilaisia lausumismalleja voidaan käyttää englannin opetuksessa. Kuitenkaan peruskoulun oppilaiden foneemisten aakkosten hallintaa ei ole aikaisemmin tutkittu. Tämä tutkimus selvittää, hallitsevatko kuudes- ja yhdeksäsluokkalaiset foneemiset aakkokset ja onko ikäryhmien välillä eroa hallinnan tasossa. Tutkimus vastaa seuraaviin tutkimuskysymyksiin: 1. Onko kuudes- ja yhdeksäsluokkalaisten välillä eroa foneemisten aakkosten hallinnan tasossa? 2. Onko foneemisiä aakkosia opetettu oppilaille?</p> <p>Tutkimusaineisto kerättiin kyselylomakkeella, johon vastasi 23 oppilasta 6. luokalta ja 18 oppilasta 9. luokalta. Aineistoa arvioitiin aiemman tutkimuksen valossa kiinnittäen erityistä huomiota yleensä suomalaisille vaikeina pidettyihin äänteisiin. Suurimmassa osassa kysymyksistä yhdeksäsluokkalaiset hallitsivat foneemiset aakkokset kuudesluokkalaisia paremmin, mutta kuudesluokkalaiset osoittivat erityistä tietoa yksittäisistä symboleista kuten schwa ə. Oppilaiden mukaan suurimmalle osalle oli opetettu reseptiivisiä taitoja foneemisissa merkeissä molemmissa ikäryhmissä.</p> <p>Tutkimus on arvokas tutkimuskentälle, koska se antaa tietoa, kuinka paljon foneemisiä symboleita jo opetetaan peruskoulussa ja kuinka hyvin oppilaat jo ymmärtävät niitä. Tutkimuksella saavutettua tietoa voidaan hyödyntää esimerkiksi valittaessa sopivaa opetusmetodia Suomen peruskouluille.</p>	
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1 INTRODUCTION

Many schoolbook series (see e.g. Aula et al. 2002 and Folland et al. 2007) use phonemic transcription symbols to teach the pronunciation of foreign languages to pupils. Knowing how well pupils master the phonemic transcription symbols is interesting and relevant because transcription symbols can also be used as a teaching method, as suggested by Kuutti (2009). In order to know how transcription symbols as a teaching method would work, it is important to know how well pupils already master the phonemic transcription symbols. No research, however, has been recently made in the particular area of mastery of phonemic transcription symbols in Finland. The present study is considered to be relevant to the research field because it reveals the current level of mastery of the phonemic transcription symbols in grades 6 and 9. In addition, the present study can be used later on as a background for designing teaching materials and as a starting point for comparison on how well pupils master the phonemic transcription symbols in the future.

The purpose of the present study is to find out if pupils in grades 6 and 9 already have some mastery of phonemic transcription symbols and if there is a difference between the two age groups' level of mastery. The study was conducted with a questionnaire sheet (see Appendix 1) that included both receptive and productive tasks that emphasized the mastery of sounds that have been considered difficult for Finns. The layout of the questionnaire sheet was designed according to the advice given by Heikkilä (1998) and the circumstances were made as supportive as possible.

The following research questions will be answered:

1. Is there a difference between pupils in grades 6 and 9 in mastering phonemic transcription symbols?
2. Have phonemic transcription symbols been taught to the students?

An expected outcome of the present study was that some qualitative differences in mastering phonemic transcriptions in different age groups would arise and they would most likely indicate that pupils in grade 9 master transcriptions somewhat better than pupils in grade 6. Another expectation was that transcription symbols have not yet established a firm position in teaching and thus no transcription symbols have been explicitly taught to most pupils.

The pupils in grade 9 were able to master the phonemic transcription symbols generally better than the pupils in grade 6; however, the pupils in grade 6 showed a better level of mastery in the case of individual sounds such as the schwa /ə/. The present study reveals that though phonemic transcription symbols are present in the pupils' study materials, they are rarely taught.

The knowledge of how well the pupils master phonemic transcription symbols can be used when teaching pronunciation and oral skills and is therefore of great importance to the research field and to teachers in Finnish schools. Phonemic transcription symbols can be used to aid English pronunciation as they provide pupils with a visual aid.

2 TEACHING PHONEMIC TRANSCRIPTION

2.1 Basic terminology in phonemic transcription of English

Phonology is the study of the patterns in a series of meaningful sounds and silences within a language. Phonetics, on the other hand, reaches across languages and is a scientific description of speech sounds. A slight phonetic difference in a word does not necessarily create a difference in meaning; when the sounds create two lexically different items, the distinguishing sounds are called phonemes and the difference is thus phonemic. Consequently, phonetic symbols are not related to a specific language and represent how the sounds are actually said, whereas phonemic symbols are generalizations for a certain language. Wells (2001) states that the International Phonetic Alphabet (IPA, see appendix 9 for the full chart) system is widely used for transcribing English. Wells (2001) explains that the IPA offers a set of symbols and some guidelines for their use but the way words are actually transcribed may change according to the purpose of their use and the transcription's needs.

The vowel system of the English language consists of monophthongs, diphthongs and triphthongs. A monophthong (e.g. /e/) is a single sound which remains the same throughout an utterance, whereas a diphthong (e.g. /aɪ/) can glide and change its vowel quality within a syllable. Logically, a triphthong (e.g. /aʊə/) includes two changes in vowel quality. Wells (2001) clarifies that the vowels can be described in a qualitative, a quantitative or a quantitative–qualitative manner, of which the last one is most used as it makes both the vowel quality and the length explicit. Rogerson-Revell (2011: 67-75) gives seven short (/ɪ ə e ʊ ɒ ʌ æ /) and five long vowels (/i: ɜ: ɔ: α: u: /) (quantitative–qualitative way of transcribing). Yule (2006: 38), however, instructs the use of the transcription symbols differently and he gives a total of 12 vowels that include the sounds /ɪ ə e ʊ ɒ ʌ æ i ε u o a / (qualitative way of transcribing). Wells (2001) introduces also Upton's scheme where, for example, the /e/ sound is replaced with a more open /ɛ/ which is normally used for languages, such as French, where there are many *e*-types.

Although ways of marking the vowels may differ slightly, the number of pure vowels (monophthongs) in English is normally considered to be 12. In addition to monophthongs, Roach (2009: 17) states that there are eight diphthongs in English: three centring diphthongs that end in a shwa

sound (/ ɪ ə e ə u ə /) and five are closing diphthongs, of which three end in /ɪ/ (/ aɪ eɪ oɪ /) and two in /ʊ/ (/ əʊ aʊ /). Yule (2006: 34-35) shows that 24 consonant sounds (/ p b t d k g f θ ð s z ʃ ʒ tʃ dʒ h j l m n ŋ r v w /) are used in a basic description of the English pronunciation but the list can be broadened to include rarer sounds such as the /x/. Although some of the symbols look similar to roman alphabets, they are not to be confused with graphemes. Graphemes are, according to Birch (2002: 62-63), a technical word that is parallel to the term phoneme. A grapheme can represent more than one sound and differs from *letter* as there can be more than 65 graphemes (e.g. *g, t, wh, sch*) but only 26 signs (e.g. *a, b, c, d*) in the alphabet in the English language.

2.2 Common difficulties for Finns in English pronunciation

Morris-Wilson (2003: 1) evaluated that the plosives / p b t d k g /, the fricatives / f v θ ð s z ʃ ʒ / and the affricates / tʃ dʒ / cause consonantal articulatory problems for Finns because they are not known in the Finnish sound system. Morris-Wilson (2003: 6) suggests that articulatory fluency will lead to speaker confidence which in turn will allow and encourage pupils to concentrate on smaller mistakes such as, defined by Collins and Mees (2003: 187), errors in intonation, lack of syllabic consonants and compound stress. However, as Morris-Wilson (2003: 6) discusses, in order to be able to concentrate on smaller errors, one must first acquire fluency in segmental phoneme production. Phoneme production can be made easier with the help of phonemic transcriptions as the grapheme-phoneme relation is not straightforward in English. In order to make the gap between pronunciation and orthography smaller, it is useful to describe oral production with transcription symbols that provide pupils with visual aids. Transcription symbols also raise pupils' awareness in pronunciation as they notice, for example, how there are, as explained by Morris-Wilson (1992: 179), strong and weak forms in English.

Rogerson-Revell (2011: 160) illustrates that there are approximately 50 words that have weak and strong forms, which account for every seventh word of English discourse. Although, according to Rogerson-Revell (2011: 173), the weak and contracted forms (e.g. *and /ə/, can't /kɑ:nt/*) are frequent and numerous in English, their use is not self-evident to L2 learners. Although the weak and strong forms do not normally affect intelligibility, they make speech more fluent and effective. The use of phonemic transcription symbols can be used to emphasize and to clarify the difference between strong and weak forms to an L2 speaker.

Adams et al. (1998: 4) explain co-articulation as fusing phonemes into one syllabic unit and instead of producing all letters as distinct phonemes, one produces an entity that can be very confusing for a child learning to write. Adams et al. (1998: 4) emphasize the importance of the medial vowel that is influenced by its surrounding consonants and that influences the initial consonant. The influence of the medial vowel can be seen, for example, in *went*, where the medial vowel *e* is nasalized before a nasal consonant *n*. Rogerson-Revell (2011: 162-170) demonstrates how also neighbouring words change the way words are pronounced (e.g. *light blue* /*laɪt blu:* / becomes /*laɪp blu:* /) and how many speakers add an intrusive *w*, *j* or *r* into their parole (e.g. *high up* /*haɪjʌp*, *media event* /*mi:diəri:vent*/). Morris-Wilson (1992: 190) comments that co-articulation is probably difficult for Finns because of a resistance towards co-articulation that arises from an idea of what is believed to be good pronunciation.

Kallioinen (1998: 77) believes that a teacher should be a role model for pronunciation: articulation must be clear and accurate and the language used by the teacher must not deviate too much from the standard language. Nevalainen (1998: 95), however, underlines that the definition of a standard language in English is difficult as there are hundreds of millions of speakers in different parts of the world. Nevertheless, probably as a result of aiming to use standard English, as Morris-Wilson (2003: 179) argues, the strong forms of the phonemes are usually used by teachers, which actually gives pupils an inaccurate pronunciation model which, according to Iivonen et al. (2006: 67-68), results in a foreign accent. According to Morris-Wilson (1992: 179) teaching the strong forms causes pronunciation difficulties, such as failing to acquire the natural flow, rhythm and stress placement, for Finns.

Morris-Wilson (1992: 187) illustrates that words can become homophones (neutralization) because of the reduction of various vowel sounds to /ə/ and because of the loss of consonants in the weak form. A syllable which includes a weak form is called a weak syllable. Rogerson-Revell (2011: 108) demonstrates that vowels can also be elided in weak syllables (e.g. *per* in *perhaps* /*præps*/). Iivonen (1998: 16) highlights that even the reduced sounds and elisions follow certain rules and they cannot be used ambiguously and, in fact, also their use is a source for learning difficulties. However, according to Rogerson-Revell (2011: 173), failing to use weak forms is not essential for intelligibility but it makes speech more effective and fluent. Morris-Wilson (2003: 184) argues that the strong form of a word is used as rarely as one time out of ten, which is why at least the awareness of the weak forms should be raised already at school. Awareness of the weak form could be raised, for example, with the help of

phonemic transcriptions; Lintunen (2005: 1) points out that pronunciation and transcription skills correlate and that phonemic transcription exercises are effective in teaching English as a foreign language especially for learners who are used to having a close grapheme-phoneme system in their native language. Kuutti (2009: 6) adds that transcriptions can be used to correct misperceptions, which is why it would be important to know how well the pupils already master the phonemic transcription symbols.

2.3 The use of phonemic transcription symbols in teaching

The Finnish *National Core Curriculum for Basic Education 2004* (2004: 137) guides teachers teaching grades 1 to 2 to focus on oral comprehension and repetition. In addition, applying their oral skills and practicing oral communication are highlighted. When teaching grades 3 to 6, the focus is still mainly on oral skills but also written skills are introduced gradually (2004: 138). The Finnish *National Core Curriculum for Basic Education 2004* (2004: 141) indicates that in grades 7 to 9, the proportion of written language is increased. Thus, in order to increase the chances of successful oral communication, it is obvious that oral skills are more valued especially at the beginning of the comprehensive school when learning foreign languages. The emphasis on oral skills can be seen, for example, in school books (e.g. Aula et al. 2002) that introduce the phonemic alphabets as visual aids in order to make pronunciation learning easier.

According to Adams et al. (1998: 2-3), learning to read and write can be made easier with the help of phonemic awareness. Giving instructions is important in developing phonemic awareness in young children because phonemic awareness is not only distinguishing sounds from each other but having explicit and reflective knowledge of phonemes. However, Byrne et al. (1991: 451) validly remark that though increased phonemic awareness and letter knowledge can indeed lead to accelerated reading and writing achievement, they are not on their own sufficient for acquisition of the alphabetic principle. In Finland the same effect of orthography can be seen vice versa, as Morris-Wilson (2003: 4, formatting in the original) believes that “many Finnish learners experience pronunciation difficulties not because of the practical ‘mechanics’ of producing a sound but because of the **spelling** used to represent the sound visually (and silently) on the page.” Kuutti (2009: 4) agrees and adds that having an orderly and systematic orthography as regards to the grapheme-phoneme relation gives an unambiguous aid for learning the language. According to Wells (1996), the principal reason for using phonetic transcription

in studying languages is that it gives a direct specification of the pronunciation of a word that the written form normally does not give. Often, however, a phonemic transcription is enough as phonemes distinguish words from each other.

It can be argued that phonemic transcription symbols are difficult to teach and learn. James (1986: 324) lists some of the disadvantages of using phonetic notation:

1. “may confuse
2. overloads (young) learners
3. poses questions of level
4. can be confusing because of the proliferation of different ‘alphabets’”

Lintunen (2004: 187), however, shows that 76.3% of the university students studying English find transcription symbols easy to understand and 20.3% find some symbols easy. As the total reaches 96.6%, Lintunen (2004: 187) argues that it is not the transcription symbols *per se* that are difficult. Though university students are more advanced in their language and academic skills, the vast majority of students considering the transcription symbols advantageous implies that also younger pupils might be able to understand the symbols.

The variation in the phoneme itself makes the recognition more difficult especially for a non-native speaker of the language. Wells (1996) remarks that homophones, such as *write* and *right*, homographs, such as *lead*, and changes in the word stress, such as in the verb-noun pair *object*, prove that the English pronunciation is rather ambiguous. Rogerson-Revell (2011: 3) adds that, in addition to lexical and grammatical meanings, phonological differences can also impact the discourse meaning with the help of word stress. As Koyama (2006: 704) shows, discourse meaning can also be affected by other phonetic gestures such as pitch, tempo, breathing, laughter, stuttering, pauses or even silence. An example of a difference in discourse meaning are the sentences in which the word stress is in bold, “I **thought** you liked it” (i.e. and the person did) and “I thought you **liked** it” (i.e. the person did not like it). In addition to differences in lexical, grammatical and discourse meaning, according to Frauenfelder and Lahiri (1989: 319), phonemes have different acoustic properties each time they are produced and they change according to the speech rate of the utterer. Moreover, the local environment of the utterance affects pronunciation together with the phonemes position. Iivonen (1998: 19) adds that also the utterer’s idiolect changes the phonemes. Changes in the acoustic properties create a challenge in

teaching phonemic transcription as a single word uttered can be pronounced in so many ways. Other factors that might have an effect on the phoneme are, for example, tone and pitch.

According to Wells (1996), learners are exposed to foreign languages more than before. Although exposure to authentic material improves the learners' listening comprehension, it is not enough to ensure good pronunciation skills. Rogerson-Revell (2011: 5-6) agrees and emphasizes that acquiring pronunciation is not obvious because, in addition to exposure, it is affected by many factors such as L1, age, phonetic ability, sense of identity, motivation and attitude, and thus teaching it is of great importance. Jenkins (2000: 83) argues that pronunciation is a major reason for problems in interaction both between fluent speakers of English and between native speakers and non-native speakers. Jenkins (2000: 83-85) shows that pronunciation errors were the most common cause for communication breakdowns between different L1-speakers (Japanese, Swiss-German and Swiss-French) and states that pronunciation is a barrier to successful communication for learners in levels from low to upper-intermediate and beyond. Having major pronunciation problems at all levels highlights how important pronunciation teaching is. Despite the importance of pronunciation teaching, according to Iivonen (1998: 15), conscious teaching of pronunciation is often ignored as teachers pay more attention to lexicon, syntax, morphology and pragmatics. Nevertheless, Iivonen (1998: 16) states that an emphasis on oral skills and also an increased level of interest towards phonetic skills, which include both productive and receptive skills, is developing.

Rogerson-Revell (2011: 212) lists seven sub-skills that learners need to develop:

1. "noticing – pronunciation elements in speech, similarities and differences between L1 and L2 pronunciation
2. discriminating – between L1 and L2 elements, between correct and incorrect elements
3. imitating – sounds and other elements of pronunciation accurately
4. reproducing – elements without prompting
5. contextualizing – individual elements within a stream of speech
6. generating – pronunciations in new contexts
7. correcting – their own inaccurate sounds and patterns"

Rogerson-Revell (2011: 243) analyses that using phonemic script in teaching is advantageous particularly for languages like English which have an inconsistent spelling system. This is because phonemic script raises the awareness of individual phonemes (especially the vowels) and phonemes in connected speech. James (1986: 324) argues that the use of phonetic symbols also distracts attention

from ordinary letter associations. In addition, Rogerson-Revell (2011: 243) explains that, once learnt, phonemic script provides the learners and teachers with a shared reference point that can be used for error correction, as, for example, the schwa would be impossible to refer to without a script. Phonemic script also helps learners to gain more information from using dictionaries and, as James (1986: 324) mentions, schoolbooks. James emphasizes that with the help of phonetic notation, the learners also become more independent as phonetic transcription symbols can be used in learners' notes and as a less teacher-oriented attitude is encouraged.

James (1986: 324) argues that phonetic notation is helpful in learning to pronounce. James's argument is supported by Lintunen (2004: 185-186), who states that 82% of university students studying English as their major think that the teaching of transcriptions has been advantageous to their pronunciation. As phonemes change a great deal due to their environment and utterer, it is even more important to teach transcription symbols to pupils explicitly as all the schoolbooks, according to Lintunen (2004: 188), use transcription symbols when introducing a new word to a learner. Wells (1996) agrees that the pronunciation of a word should be given when the word is incorporated into the learners' active vocabulary. Although the pronunciation of lexical items is given in schoolbooks, Lintunen (2004:187) states that 76.9% of university students of English had not received teaching in the use of transcription symbols in lower levels of school. There is no recent research about the present use of transcription symbols in comprehensive schools and thus no knowledge if the situation has changed.

3 METHODOLOGY

3.1 Research questions

The purpose of the present study is to find out if pupils in grades 6 and 9 in Finland already have some mastery of phonemic transcription symbols and if there is a difference between the two age groups' level of mastery. In addition, the study discovers if the pupils already have some experience of phonemic transcription teaching. The following research questions will be answered:

1. Is there a difference between pupils in grade 6 and 9 in mastering phonemic transcription symbols?
2. Have phonemic transcription symbols been taught to the students?

An expected outcome of the present study is that some qualitative differences in mastering phonemic transcriptions in different age groups will arise and the results will most likely indicate that the pupils in grade 9 master transcriptions somewhat better than the pupils in grade 6 in both receptive and productive skills. Transcription recognition is believed to be easier than a more productive task where the pupils might be confused by the ambiguous grapheme-phoneme relationship of English. It is to be expected that transcription symbols have not yet established a firm position in teaching and thus no transcription symbols have been explicitly taught to most pupils.

3.2 The approach

The data collection was conducted through a questionnaire (see Appendix 1). It was decided that the questionnaire should be done in writing to avoid any inaccuracies in interpreting the answers. The answers were investigated both quantitatively and qualitatively and the statistical value of the results was calculated¹. A questionnaire sheet (see Appendix 1) has both receptive and productive sections to meet the needs of the research questions. In addition to the questionnaire, the author asked the English teacher of grade 9 if she had taught the transcription symbols to the pupils. The teacher was free to answer as broadly as she wished. The author was unable to ask the question from the grade 6 teacher, because she was absent at the time and the substitute teacher's teaching habits would not necessarily have been comparable to what had been previously taught to the group.

¹Results are calculated with a statistical significance calculator by GraphPad Software Inc. <http://www.graphpad.com/quickcalcs/contingency1.cfm>

The transcripts follow the International Phonetic Alphabet (IPA, see Appendix 9 for a full chart) system because it is often used in pupils' schoolbooks (see e.g. Aula et al. 2002 and Folland et al. 2007). The vowels are introduced in a quantitative–qualitative way of transcribing (e.g. Rogerson-Revell 2011: 67-75) with the exception of transcribing different *e*-types, where Upton's scheme (see e.g. Wells 2001) is used to make the difference between *e*-sounds more distinct. This decision was made because of a personal preference of the author: the difference of the *e*-sounds is significant in other languages such as French and, in the author's opinion, the same phonetic symbols are to be used in different languages. The diphthongs are introduced as is usual in the research field (see e.g. Roach 2009: 17): there are three centring diphthongs (/ ɪə eə ʊə /) and five closing diphthongs (/ aɪ eɪ ɔɪ əʊ aʊ /). The consonants for the questionnaire were chosen based on Yule (2006: 34-35) because it thoroughly introduces the consonant system of English. The mark /x/ was included to cover words such as *loch*. Including the mark *x* tells if the pupils have noticed that the pronunciation of words such as *thanks* is /θæŋks/ instead of */θæŋx/ which might be a suggestion for pronunciation from a pupil that confuses the grapheme and phoneme systems at least occasionally.

The focus in the present study is on monophthongs and diphthongs but also two triphthongs were included in the first question (see Appendix 1) to test the awareness of them. Monophthongs and diphthongs were tested both receptively and productively. However, due to the scope of the present study, the productive part is not analyzed. Nevertheless, the reader can find the numeric results in the (see Appendix 5, Appendix 6, Appendix 7 and Appendix 8). As no statistical differences were found in phonemic transcription recognition, also that section has been left without further analysis (see Appendix 4).

3.3 Data collection

3.3.1 The questionnaire

The questionnaire (see Appendix 1) begins with a question of how many phonemic transcription symbols the pupils know in a list provided. In the present study the first question functions not only as a question of recognizing the phonemic symbols but also as a reference point if the pupils want to check how a symbol is marked.

As suggested by Heikkilä (1998: 47-48), the questionnaire is built so that it moves logically from the easiest question to the most difficult. Personal experience questions end the questionnaire because otherwise they might affect how the upcoming questions are answered. Another reason for leaving personal questions last is, according to Dörnyei and Taguchi (2010: 48), that once you get your participants ready to answer, giving them a questionnaire that reminds them of filling in a passport application can be highly off-putting. As encouraged by Heikkilä (1998: 47), the instructions are made simple and the outlook of the questionnaire (see Appendix 1) has been made as appealing as possible; the questionnaire also has a clear sequencing with the help of running numbers. The first three sections of the questionnaire consist of structured multiple choice questions, the fourth of an open-ended question and sections 5 and 6 ask for information about previous experience with transcripts.

In the pilot stage of the present study (n=6), some pupils left a few questions unanswered in the productive part, most likely because they did not feel certain about their skills. Based on the pilot, the productive task was modified to ask only for one phonemic symbol (monophthong or diphthong) instead of a whole word. In the second pilot (n=6), all of the questions were answered, which was interpreted to mean that the questions were no longer too challenging. The questionnaire sheet was referred to as a quiz because the pupils might otherwise have felt pressure to answer correctly. With the name quiz, the pupils were probably more willing to try filling in the transcription symbols even if they felt insecure.

As Heikkilä (1998: 50) advises, the number of possible answers to multiple choice questions was limited, in the present case to three options in sections 2 and 3 (see Appendix 1). Sections 5 and 6 that deal with background information have the options *yes/no*. Heikkilä (1998: 50) states the advantages of multiple choice questions: answering does not take too long and the answers are easy to analyze statistically. Multiple choice questions, of course, have also disadvantages that, according to Heikkilä (1998: 50), consist of answering without considering the answers properly, not having an option that the respondent would like and that the options might lead the respondent to answer in a certain way. Nevertheless, multiple choice questions are ideal for the present study because they limit the possible number of different errors. Limiting the number of options makes it easier to group the errors.

As, according to Heikkilä (1998: 48), completely open-ended questions are easy to construct but more difficult to analyze, the present study uses partly open-ended questions in section 4 of the questionnaire

(see Appendix 1). As grouping the open-ended questions can, according to Heikkilä (1998: 48), be challenging and open-ended questions can attract the respondent to leave some questions blank, only the (assumedly) most difficult sound of the word is left blank. This ensures the questionnaire's validity, as the questionnaire asks for a specific sound. To make sure that the pupils do not feel too insecure about filling in the questionnaire, a list of transcription symbols is provided together with section 1.

Section 5 in the questionnaire (see Appendix 1) is a *yes/no* question of whether the respondent has been taught to recognize some phonemic symbols. To avoid differences in how the pupils define teaching, the pupils were advised to choose *yes* if even one symbol had been taught to them. Section 6 (see Appendix 1) is similar to section 5 but it asks for information whether the pupil has been taught to write the symbols. Section 5 and 6 thus ask for both the teaching of receptive skills and productive skills.

The words for the quiz were chosen based on Morris-Wilson's (2003: 84-85) examples of consonants of the Received Pronunciation (RP) and pure vowels of RP. The consonant of RP examples used in the pilot study were *happen, ribbon, ladder, very, thank, this, ice, easy, sugar, pleasure, watch, suggest* and *write*. Pure vowels of RP examples used in the pilot study were *Monday, bat, son, brother* and *bird*. The pilot study, however, suggested that only the words *ladder, thank, this, ice, easy, pleasure, watch, suggest, write, bat* and *bird* were distinctive between the age groups and thus, only they have been included in the present study. In addition, a word *talk* was added to include a long vowel in the quiz. The phonemic transcriptions for the lexical items were checked from *Concise Oxford Dictionary of Current English* (1990), in which the transcripts follow the International Phonetic Alphabet (IPA) system.

Unfortunately, the word processor used in printing the questionnaires did not recognize the symbol /ɑ:/ in the first section and printed it only as a ., which was not noticed before the questionnaire was filled in by the pupils in grade 9. The author of the present study had to write the symbol in hand for the questionnaire sheet of grade 6. Fortunately, the symbol /ɑ:/ was not in any form present in any other sections of the questionnaire.

3.3.2 The respondents

The target group of the present study is pupils in grades 6 and 9, who study English as the A-language in a Finnish school in Central Finland. The total number of respondents reached 41, of whom 23 were in grade 6 and 18 in grade 9. The pupils in grade 6 have studied English for almost four years whereas the pupils in grade 9 have almost seven years of experience with English. In order to avoid some unwanted variables, such as the pupils feeling nervous about the quiz, the respondents filled in the quiz in a regular classroom. The quiz was briefly introduced by explaining who is conducting the present study and for what purposes. Some instruction was given orally to highlight that it is more important to try than not to answer at all.

The respondents were asked to remain silent until everyone had finished their questionnaire. Silence was accomplished in grade 9 with few exceptions whereas the pupils in grade 6 started to talk about matters of no relevance to the present study for a few minutes and the discussion might have disturbed those who still had their questionnaire unfinished. Nevertheless, the class settled down with minor exceptions when they were given the permission to draw on the backside of the questionnaire sheet while waiting for others to finish.

The pupils in grade 9 did not need any complementary advice but a few respondents wanted to make sure that they had understood correctly by asking a question from the author. The questions asked in grade 9 were mostly technical, for example, a question on how to mark the symbols recognized in the first section. The pupils in grade 6, however, showed more insecurity by asking questions related to the content and they also expressed their anxiety by stating that they did not know the answer. The author, nevertheless, tried to convince the respondents that it was more important to do one's best than to answer each question correctly. All questions and pieces of advice were in Finnish.

4 MASTERY OF PHONEMIC TRANSCRIPTION SYMBOLS

An expected outcome of the study was that the pupils in grade 9 master the phonemic transcription symbols better than those in grade 6. The pupils were expected to make some mistakes in section 4 of the questionnaire (see Appendix 1) as they were most likely not accustomed to using transcription symbols themselves. Paananen (1998: 117) states that in her study ~30% of all the problems in pronunciation were caused by the unambiguous grapheme-phoneme relationship in Finnish that the pupils are accustomed to use. Thus the orthography of the words was likely to cause some mistakes in the present study as well.

The two age groups were compared to each other qualitatively. Transcription symbols were expected not to have been taught to the pupils, even though they are clearly present in many schoolbooks (see e.g. Aula et al. 2002 and Folland et al. 2007). The present study is mostly qualitative but some figures are also given to make interpreting the results easier.

4.1 Performance in symbol recognition

In symbol recognition, the pupils in grade 9 recognized the symbols for bilabial plosives *p* and *b*, alveolar plosives *t* and *d* and velar plosives *k* and *g* better than the pupils in grade 6 (see Appendix 2). The pupils in grade 9 were able to recognize the plosives except for one who had difficulties recognizing the voiceless bilabial plosive *p*. Though one pupil was unable to recognize the symbol *p*, the answers imply that all plosive sounds are familiar to the pupils in grade 9. However, the result for the phoneme *p* is not quite statistically significant ($P=0.0594$). Nevertheless, the difference is statistically significant in the case of the phonemes *b*, *t* and *d* ($P=0.0123$) and for the phonemes *k* and *g* ($P=0.0266$).

In addition to plosives, also the recognition percentage of the symbol for the voiced labiodental fricative *f* is statistically significant ($P=0.0266$). However, the symbol for the voiceless labiodental fricative */v/* was recognized by rather few pupils (~70% in grade 6 and ~84% in grade 9, $P=0.4673$). The recognition level is especially low in comparison to other symbols that are present in both phonemic transcription symbols and in English orthography. The difference in the level of recognition between the two labiodental fricatives can be explained by a different amount of friction noise; Morris-

Wilson (1981: 56; 2003: 1) clarifies that the voiced labiodental fricative /v/ is difficult for Finns because, regardless of its place in a word, it is always produced with less noticeable friction noise in English in comparison to the unmistakable friction noise in /f/. The difficulties the pupils had in the present study could be interpreted to support Paananen's (1998: 116) study, where 94% of the pupils (n=16) were unable to differentiate the labiodental fricatives *v* and *w* from each other. Morris-Wilson (2003: 1) explains that Finns often pronounce the voiced labiodental fricative /v/ as a voiced frictionless labiodental continuant /v/, which is usually interpreted as the voiced labio-velar approximant /w/.

The symbols *r*, *m*, *l* and *n* received the same number of recognitions as the voiced labiodental fricative /v/ (~70% in grade 6 and ~84% in grade 9, P=0.4673). Paananen (1998: 113) mentions that sonorants /l m n/ are longer when placed before lenis obstruents (weaker sounds), which could explain some of the recognition difficulties of the pupils in the present study. However, as the symbols were presented individually, the author does not believe the varying length of the sonorants to have led to not being able to recognize the symbols. It could be hypothesized that the pupils had difficulties in recognizing *r* because it might have been marked differently in the pupils' school books due to a varying emphasis on quantitative and/or qualitative description of phonemes; some school books also use an asterisk for the silent *r* sound (see e.g. Aula et al. 2002). Wells (2004-2005: 5) states that it is often typographically simpler to transcribe *r* rather than *ɹ* even though phonetically the sound in, for example, the word *red* is more like an approximant rather than a trill.

In addition, the pupils in grade 6 were able to recognize the symbols *ʒ* *ɛ* *ɪ* *ʊ* *ʌ* *ə* and *ʌʊ* better than the pupils in grade 9 (see Appendix 2). It is worth noticing that these symbols are typical of phonemic transcriptions but not of the orthography of English. On one hand, the recognition of particularly these symbols might imply that the symbols that are not typical of English orthography have been taught to the pupils in 6 but not to the pupils in grade 9. On the other hand, the pupils in grade 9 might define recognizing the symbols more critically and thus have not chosen the symbols unique to the phonemic alphabets. The pupils in grade 6 were especially good at recognizing the schwa sound *ə* as 61% of the pupils in grade 6 were able to recognize the symbol when the corresponding percentage for the pupils in grade 9 is 28% (P=0.0582). Nevertheless, the aforementioned difference is not quite statistically significant.

The symbols that look the same in English orthography and in phonemic transcriptions were generally recognized more often than symbols that appear only in the latter. The tendency not to recognize a symbol increases when the symbol is a diphthong and even more so in the case of triphthongs. The reason for the weaker performance is probably that triphthongs and diphthongs seem to include more sounds than a monothong and the pupils might have had difficulties recognizing individual symbols in them.

4.2 Performance in pronunciation recognition

The pupils in grade 9 succeeded in choosing the correct pronunciation more often than the pupils in grade 6 in all questions of the section 2 (see Appendix 3). The result might imply that the pupils in grade 9 have a broader vocabulary and are thus able to connect the specific pronunciation to the correct orthographic form.

The pupils in grade 9 were able to recognize the pronunciation of /*ais*/ (see Appendices 1 and 3) better than the pupils in grade 6 ($P=0.1963$). Though no statistical difference was found, it can be presumed that the pupils in grade 9 have a broader vocabulary than the pupils in grade 6. The pupils in grade 9 are thus also more conscious of that the s-marker for third person singular (*he coughs, he loves*), for plural nouns (*troughs, gloves*) and for genitive (*Cliff's book, Dave's book*) is pronounced either as /*s*/ or /*z*/ depending on the previous sound (Morris-Wilson 1981:59). As pupils become familiar with words that differentiate the voiceless and voiced sounds it is likely that also differentiating the *s* sounds in multiple auditive environments becomes easier in time which could partly explain the difference in recognizing /*ais*/.

In the case of /*bæt*/ (see Appendices 1 and 3) it is possible that the pupils in grade 6 confused the pure vowel *æ* with an orthographic form *ae*, whereas the pupils in grade 9 are more accustomed to the phonemic symbol and thus were able to recognize the pronunciation better ($P=0.3216$). In addition, the pupils in grade 9 might also be more aware of the allophones of the sound /*æ*/. Wiik (1965: 68) states that the English language has two allophones for the sound /*æ*/: one occurs immediately before the voiced velarized alveolar lateral approximant /*l*/, another can be found in all other situations that include the sound /*æ*/. Morris-Wilson (1981:95) states that Finns can usually differentiate the sounds /*p*/ and /*b*/ because of their differences in voicing, however, the aspiration of the sound can be

challenging sometimes. Nevertheless, the aspiration difficulties are not assumed to have influenced the result.

The pronunciation of /*ladə(r)*/ was probably difficult because of its orthographic double consonant that is pronounced only as a voiced alveolar plosive /d/. The pupils might have been confused also by the different ways of marking the sound /r/ in the pupils' school books: Wells (2004-2005: 5) states that the English /r/ is sometimes transcribed as /r/ in order to make the typographical form simpler, in *Concise Oxford Dictionary of Current English* (1990) the silent *r* that is not always pronounced is marked as (*r*) but for example Aula et al. (2002) have decided to use an asterisk. The pupils in grade 9 might have had some difficulties in recognizing the correct pronunciation also because of the schwa sound /ə/ that they had problems with in the first section (see 4.1 Performance in symbol recognition above). Though the pupils in grade 9 were able to recognize the pronunciation better, no statistical difference (P=0.4290) is reported.

The recognition of the pronunciation /*pleʒə(r)*/ was statistically significant (P=0.0278) as ~72% of the pupils in grade 9 chose the correct alternative, whereas only ~35% of the pupils in grade 6 were able to do the same. Morris-Wilson (1981: 72) points out that the voiced palato-alveolar fricative /ʒ/ is an unusual sound in the English language as it never commences a word except for a few loan words. As the sound is rarer in the initial position, it is natural that the pupils in grade 9 who most likely have a broader vocabulary also recognize the sound better than pupils in grade 6. In addition, it is probable that pupils in grade 9 have raised more phonemic awareness and are able to differentiate sounds also in the middle of the word.

Though there is statistical significance in only one of the questions, the section implies that pupils in grade 9 have better skills in differentiating words that, according to Morris-Wilson (2003: 84-85), might cause difficulties for Finns learning English pronunciation. Assumedly, the pupils in grade 9 were able to perform better than pupils in grade 6 due to a broader vocabulary and knowledge of the English pronunciation that has increased over the three years in upper comprehensive school.

4.3 Personal experiences of the pupils

The pupils in grades 6 and 9 were asked if phonemic transcription symbols had been taught to them. The information was gathered with section 5 in the questionnaire (see Appendix 1). It was previously hypothesized that pupils in grade 6 might have received teaching in phonemic transcription symbols because they recognized more symbols that are used only in transcriptions than pupils in grade 9. However, the questionnaire shows the opposite as receptive skills were taught to 61% pupils of both groups ($P=1.0000$). In addition, productive skills were also taught more to pupils in grade 9. The results imply that pupils in grade 9 are possibly more critical to the definition of recognizing the symbols as they did not previously admit to recognizing the symbols unique to transcriptions. The following table shows all the numeric values of the section 5.

Table 6

The number of pupils who had been taught	Grade 6 (n=23)	Grade 9 (n=18)	Fisher's exact test, two-tailed P value
receptive skills	14 (~61%)	11 (~61%)	1.0000
productive skills	2 (~9%)	5 (~28%)	0.2086

As recent school books (e.g. Aula et al. 2002) show, phonemic symbols are used already at the basic level. The teacher of grade 9 says that she pays attention to difficult words and to their pronunciation orally and wishes she had more time to teach the actual symbols. However, as the teacher of the pupils in grade 9 reports, the symbols are not usually explicitly taught to the pupils because of lack of time. Accordingly, productive skills have been taught only to ~9% of the pupils in grade 6 and to ~28% of the pupils in grade 9. Nevertheless, the difference is not statistically significant ($P=0.2086$).

5 DISCUSSION AND CONCLUSION

5.1 Major findings

The results show that the pupils in grade 9 master the phonemic transcription symbols better than the pupils in grade 6 as they outperformed them in almost every case; the only symbols that the pupils in grade 6 seemed to recognize better than the pupils in grade 9 were the symbols unique to the phonemic alphabets. There is no obvious reason why the results differ in the case of certain symbols but one possible reason could be that the pupils have used different book series that emphasize the sounds and their symbols differently. For example, Aula et al. (2002) introduces different transcription symbols gradually and concentrates on specific sounds at a time whereas Auvinen et al. (2009) only introduces the sounds as a whole. In addition, Auvinen et al. (2009: 162) uses a quantitative way of transcribing and thus, for example, uses the symbol ə in two contexts: /ə/ and /ə:/, the latter replacing the quantitative-qualitative way of transcribing /ɜ:/ that was introduced earlier by Rogerson-Revell (2011: 67-75). Having seen multiple ways of transcribing the pupils in grade 9 might have confused the symbols and were thus unable to recognize the schwa sound /ə/ in the present study. There is no previous research on how different schoolbook series introduce phonemic transcription symbols and no knowledge of what book series the specific target group has used. Thus the author had to base the evaluation of the results on personal experiences on how often the book series change and the experiences of the target group pupils might be different. As there is no knowledge of how pupils in Finland have previously mastered the symbols in elementary schools and the results have no comparison point in the specific age group. However, studies (e.g. Lintunen 2004) made about university students' experiences about phonemic transcription symbols have shown that the symbols can be useful as a teaching method.

The reason for the better recognition percentages in grade 9 could be due to a broader vocabulary. A broad vocabulary helps the pupils see a difficult word as a whole instead of separate symbols which makes it easier for the pupil to think of the correct pronunciation of familiar words. The pupils in grade 9 have also used the phonemic transcription symbols implicitly for a longer period of time than the pupils in grade 6, which, undoubtedly, is an advantage in recognizing the symbols. Nevertheless, both pupils in grade 6 and in grade 9 had difficulties in separating the orthography and the phonemic

transcription symbols from each other. The difficulties are especially common for Finns as they are used to having a close grapheme-phoneme relation. Another reason for not being able to separate the two is that the symbols have not been explicitly taught to them. Thus the pupils have not received enough guidance in using the symbols as efficiently as possible and cannot profit from the symbols in their school books to the maximum. However, there is no guarantee that the pupils would have actually used the symbols even if the symbols had been taught to them. In addition, there is no research on how the results might be different if the pupils had received more explicit teaching of the symbols throughout their school history. Nevertheless, Kuutti (2009) used small test groups to examine the area on a smaller scale and the results were promising even though they were not statistically significant.

The present study reveals that though phonemic transcription symbols are present in pupils' study materials, they are rarely taught in comparison to their use in the school books: most school books give a phonemic transcription for each new word in the vocabulary (see e.g. Aula et al. 2002) but only 61% of the pupils in both grades 6 and 9 report that receptive skills have been taught to them. According to a teacher in grade 9, the reason for not teaching the symbols is the lack of time. The pupils' attention is, however, drawn to the pronunciation of the word and it is possible that the pupils read the phonemic transcription for a word while repeating it. Nevertheless, the pupils do not necessarily learn the symbols well enough if they are only read while actually concentrating on producing the correct pronunciation. However, no previous research is available on the specific area.

The knowledge of how well pupils master phonemic transcriptions can be used in teaching, for example when teaching pronunciation and oral skills, and is therefore of importance to the research field. The present study implies that the pupils in grade 9 have better prerequisites for the use of phonemic transcription symbols as a teaching method that Kuutti (2009) has examined more thoroughly.

5.2 Limitations of the present study and areas of further research

The limitations of the present study are apparent as the target group has no real statistical value outside the present study. Due to the scope of the present study, also some sections of the questionnaire were left unanalyzed. Although the sections for the analysis were carefully selected, it is possible that something has been left without the attention the matter would deserve. Further research is needed with

more specific questions, a deeper analysis and a larger target group because the present study does not yet fully reveal how well the pupils master the phonemic alphabets nationwide. In addition, the reasons for the differences between the grades 6 and 9 should be more thoroughly examined as most of the analysis was now based only on one questionnaire and previous research.

Having no comments from grade 6 teachers is a flaw in the present study as now there is no comparison between the teachers' views on teaching transcription symbols. Knowing, for example, that the grade 6 teacher would not consider transcription symbols important, might have supported the results on productive symbols teaching as ~9% of the pupils in grade 6 and ~28% of the pupils in grade 9 expressed that transcription symbols had been taught to them. However, even having asked the question also from the present grade 6 teacher would not have fully explained the difference between the two groups as the groups' teachers might have changed annually. Further research on how teachers perceive teaching phonemic transcription symbols and how teachers realize it in their lessons is thus needed.

As there is no knowledge of how different schoolbook series introduce phonemic transcription symbols it should be more thoroughly studied. The study would seek for information about if the schoolbook series are in accordance with National Core Curriculum for Basic Education 2004 (*Perusopetuksen opetussuunnitelman perusteet 2004* 2004) that demands an emphasis on oral communication throughout elementary school. Further research is also needed on whether the results in mastering the phonemic alphabets differ if a different school book series is used.

As the present study shows, the teaching of phonemic transcription symbols is not sufficient when compared to the emphasis given to them in the vocabulary sections of recent school books. Thus more research is needed about teaching the symbols. The teachers' opinions about the importance of phonemic transcription symbols should also be examined as the teacher has a major influence on what is actually taught. The teachers' opinions also have an effect on the pupils' views on learning the phonemic transcription symbols and thus the actual results of the method are affected. The method itself should be more thoroughly studied: it is important to know how much effort is needed for teaching the symbols and how much the pupils' pronunciation enhances. The present result should also be compared later with results gained with phonemic transcription symbols as a teaching method to see

the real advantages of the method. If possible, the method should be used throughout the pupils' schooling in order to see the impacts on a larger scale.

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² The exercises in the book are based on exercises that have been compiled and used in the English Department of Oulu University. Who originally designed the exercises is not known but it can be assumed that at least Richard Goymer, Malcolm Hicks, Jane McKinlay, Bentley Mathias and the editor himself have made some changes in the material. Morris-Wilson has written the introductory notes, drawn the diagrams and put the whole into a form of a book. However, as the original authorship for many parts of the exercises is untraceable, Morris-Wilson has named himself the editor of the book.

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Appendix 1 TIETOVISA

Kokeile, kuinka hyvin osaat kirjoittaa englannin lausumista. Olet samalla arvokas apu Jyväskylän yliopiston opiskelijan tekemälle tutkimukselle. Tutkimus selvittää, kuinka hyvin kuudes- ja yhdeksäsluokkalaisten hallitsevat ääntämisen kirjoitetun muodon. Ei haittaa, vaikkot tuntisi kaikkia tietovisan sanoja tai merkkejä, tärkeintä on, että yrität parhaasi. Kiitos, että täytät tietovisan huolellisesti!

- 1) Lue englannin ääntämisen kuvaamisessa käytettävät merkit läpi. Ympyröi ne merkit, jotka ovat sinulle ennestään tuttuja.

p	b	t	d	k	g	f	θ	ð	s	z	ʃ
ʒ	tʃ	dʒ	h	j	l	m	n	ŋ	r	v	w
ɛ	ɪ	ʊ	ɔː	uː	ɑː	iː	ɜː	ɒ	ʌ	ə	æ
eɪ	aɪ	ɔɪ	aʊ	əʊ	eə	ɪə	ɔɪ	ʊə	aɪə	aʊə	x

- 2) Ympyröi ääntämistä vastaava sana. Vain yksi vastaus on oikein.

a) /aɪs/	aisle	eyes	ice
b) /bæt/	bat	bet	beat
c) /'lɑdə(r)/	leader	ladder	late
d) /'plezə(r)/	player	pleasure	pleaser

- 3) Ympyröi sanaa vastaava ääntäminen. Vain yksi vastaus on oikein.

a) bird	/bɪrd/	/bɜːd/	/bɔːrd/
b) this	/ðɪs/	/θɪs/	/tɪs/
c) write	/raɪt/	/vraɪt/	/vraɪt/
d) thank	/ðæŋk/	/θaŋk/	/θæŋk/

- 4) Täydennä puuttuva äänne. Voit käyttää apuna ensimmäisen kohdan taulukkoa.

a) easy	/iː ___ɪ/
b) watch	/wɒt ___/
c) talk	/t ___k/
d) suggest	/sə' ___est/

- 5) Onko sinua opetettu tunnistamaan tietovisassa esiintyneitä merkkejä? Jos sinua on opetettu tunnistamaan yksikin merkki, vastaa kyllä.

Ympyröi sinua kuvaava vaihtoehto.

kyllä	ei
-------	----

- 6) Onko sinua opetettu kirjoittamaan tietovisan merkkejä? Jos sinua on opetettu kirjoittamaan vähintään yksi merkki, vastaa kyllä. Ympyröi sinua kuvaava vaihtoehto.

kyllä	ei
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Kiitos vastauksista!

Appendix 2

The dark red is used to mark all the parts that were statistically significant. The lighter red marks the part in which the pupils in grade 6 outperformed the pupils in grade 9. The violet presents all the symbols that are not used in the English orthography.

Table 1

The sign asked	The number of students who recognized the sign in grade 6 (n=23)	The number of students who recognized the sign in grade 9 (n=18)	Fisher's exact test, two-tailed P value
p	16 (~70%)	17 (~94%)	0.0594
b	16 (~70%)	18 (100%)	0.0123
t	16 (~70%)	18 (100%)	0.0123
d	16 (~70%)	18 (100%)	0.0123
k	17 (~74%)	18 (100%)	0.0266
g	17 (~74%)	18 (100%)	0.0266
f	17 (~74%)	18 (100%)	0.0266
θ	13 (~57%)	13 (~72%)	0.3457
ð	11 (~48%)	9 (50%)	1.0000
s	17 (~74%)	15 (~83%)	0.7061
z	17 (~74%)	15 (~83%)	0.7061
ʃ	12 (~52%)	12 (~67%)	0.5239
ʒ	11 (~48%)	8 (~44%)	1.0000
tʃ	4 (~17%)	10 (~56%)	0.0192

dʒ	6 (~26%)	8 (~44%)	0.3216
h	16 (~70%)	16 (~89%)	0.2544
j	16 (~70%)	16 (~89%)	0.2544
l	16 (~70%)	15 (~83%)	0.4673
m	16 (~70%)	15 (~83%)	0.4673
n	16 (~70%)	15 (~83%)	0.4673
ŋ	8 (~35%)	10 (~56%)	0.2186
r	16 (~70%)	15 (~83%)	0.4673
v	16 (~70%)	15 (~83%)	0.4673
w	16 (~70%)	14 (~78%)	0.7262
ɛ	4 (~17%)	2 (~11%)	0.6786
ɪ	5 (~22%)	2 (~11%)	0.4376
ʊ	2 (~9%)	1 (~6%)	1.0000
ɔ:	3 (~13%)	3 (~17%)	1.0000
u:	6 (~26%)	7 (~39%)	0.5033
ɑ:	3 (~13%)	not asked	not calculated
:	not asked	6 (~33%)	not calculated
i:	6 (~26%)	9 (50%)	0.1912
ɜ:	3 (~13%)	2 (~11%)	1.0000
ɒ	3 (~13%)	1 (~6%)	0.6178
ʌ	5 (~22%)	1 (~6%)	0.2051
ə	14 (~61%)	5 (~28%)	0.0582

æ	16 (~70%)	14 (~78%)	0.7262
eɪ	2 (~9%)	3 (~17%)	0.6384
aɪ	3 (~13%)	3 (~17%)	1.0000
ɔɪ	1 (~4%)	2 (~11%)	0.5728
aʊ	3 (~13%)	1 (~6%)	0.6178
əʊ	1 (~4%)	2 (~11%)	0.5728
eə	3 (~13%)	3 (~17%)	1.0000
ɪə	1 (~4%)	1 (~6%)	1.0000
ʊə	1 (~4%)	1 (~6%)	1.0000
aɪə	1 (~4%)	0 (0%)	1.0000
aʊə	1 (~4%)	0 (0%)	1.0000
x	12 (~52%)	11 (~61%)	0.7523
Total number of recognitions/total number of possible recognitions (/a:/ and /:/ have been left out to make the results comparable)	438/1058 (~41%)	420/828 (~51%)	

Appendix 3

The dark red is used to mark all the parts that were statistically significant.

Table 2

The pronunciation asked	The number of correct answers in grade 6 (n=23)	The number of correct answers in grade 9 (n=18)	Fisher's exact test, two-tailed P value
/aɪs/	13 (~57%)	14 (~78%)	0.1963
/bæt/	6 (~26%)	8 (~44%)	0.3216
/ˈlɑdə(r)/	17 (~74%)	16 (~89%)	0.4290
/ˈplezə(r)/	8 (~35%)	13 (~72%)	0.0278
Total number of correct answers/total number of possible correct answers	44/92 (~48%)	51/72 (~71%)	

Appendix 4

Table 3

The word asked	The number of correct answers in grade 6 (n=23)	The number of correct answers in grade 9 (n=18)	Fisher's exact test, two-tailed P value
bird	4 (~17%)	4 (~22%)	0.7126
this	8 (~35%)	11 (~61%)	0.1220
write	3 (~13%)	6 (~33%)	0.1474
thank	7 (~30%)	5 (~28%)	1.0000
Total number of correct answers/total number of possible correct answers	22/92 (~24%)	26/72 (~36%)	

Appendix 5

Table 4

The symbol suggested by the pupils for the sound in <i>easy</i>	z	s	ʃ	other	no answer
grade 6 (n=23)	3 (~13%)	10 (~43%)	3 (~13%)	7 (~30%)	0 (0%)
grade 9 (n=18)	4 (~22%)	5 (~28%)	1 (~6%)	5 (~28%)	3 (~17%)
Fisher's exact test, two-tailed P value	0.6786				

Appendix 6

Table 5

The symbol suggested by the pupils for the sound in <i>watch</i>	f	h	sh	ch	c	other	no answer
grade 6 (n=23)	3 (~13%)	4 (~17%)	1 (~4%)	2 (~9%)	3 (~13%)	9 (~39%)	1 (~4%)
grade 9 (n=18)	7 (~39%)	1 (~6%)	1 (~6%)	1 (~6%)	0 (0%)	2 (~11%)	6 (~33%)
Fisher's exact test, two-tailed P value	0.0753						

Appendix 7

Table 6

The symbol suggested by the pupils for the sound in <i>talk</i>	ɔ:	ɑ:	ɒ	æ	aɪ	al	other	no answer
grade 6 (n=23)	0 (0%)	1 (~4%)	2 (~9%)	6 (~26%)	3 (~13%)	2 (~9%)	9 (~39%)	0 (0%)
grade 9 (n=18)	5 (~28%)	2 (~11%)	1 (~6%)	1 (~6%)	1 (~6%)	3 (~17%)	3 (~17%)	2 (~11%)
Fisher's exact test, two-tailed P value	0.0114							

Appendix 8

Table 7

The symbol suggested by the pupils for the sound in <i>suggest</i>	dʒ	ʒ	gg	g	ð	other	no answer
grade 6 (n=23)	0 (0%)	1 (~4%)	1 (~4%)	11 (~48%)	2 (~9%)	6 (~26%)	2 (~9%)
grade 9 (n=18)	5 (~28%)	1 (~6%)	2 (~11%)	1 (~6%)	1 (~6%)	4 (~22%)	4 (~22%)
Fisher's exact test, two-tailed P value	0.0114						

Appendix 9

THE INTERNATIONAL PHONETIC ALPHABET (revised to 2005)

CONSONANTS (PULMONIC)

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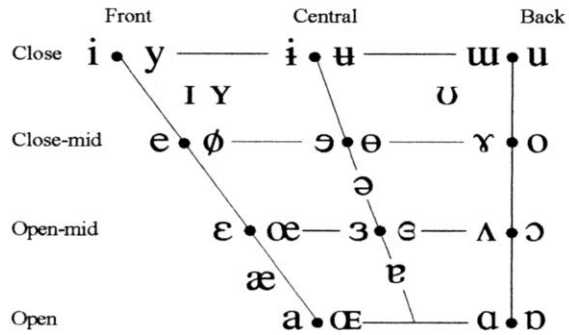
	Bilabial	Labiodental	Dental	Alveolar	Post alveolar	Retroflex	Palatal	Velar	Uvular	Pharyngeal	Glottal
Plosive	p b			t d		ʈ ɖ	c ɟ	k ɡ	q ɢ		ʔ
Nasal	m	ɱ		n		ɳ	ɲ	ŋ	ɴ		
Trill				r					ʀ		
Tap or Flap		ⱱ		ɾ		ɽ					
Fricative	ɸ β	f v	θ ð	s z	ʃ ʒ	ʂ ʐ	ç ʝ	x ɣ	χ ʁ	ħ ʕ	h ɦ
Lateral fricative				ɬ ɮ							
Approximant		ʋ		ɹ		ɻ	j	ɰ			
Lateral approximant				l		ɭ	ʎ	ʟ			

Where symbols appear in pairs, the one to the right represents a voiced consonant. Shaded areas denote articulations judged impossible.

CONSONANTS (NON-PULMONIC)

Clicks	Voiced implosives	Ejectives
◌ɸ Bilabial	◌ɓ Bilabial	' Examples:
◌ǀ Dental	◌ɗ Dental/alveolar	◌p' Bilabial
◌ǃ (Post)alveolar	◌ɟ Palatal	◌t' Dental/alveolar
◌ǁ Palatoalveolar	◌ɠ Velar	◌k' Velar
◌ǃ Alveolar lateral	◌ʛ Uvular	◌s' Alveolar fricative

VOWELS



Where symbols appear in pairs, the one to the right represents a rounded vowel.

OTHER SYMBOLS

- M Voiceless labial-velar fricative
 - W Voiced labial-velar approximant
 - ʋ Voiced labial-palatal approximant
 - H Voiceless epiglottal fricative
 - ʕ Voiced epiglottal fricative
 - ʡ Epiglottal plosive
 - ç ʐ Alveolo-palatal fricatives
 - ɻ Voiced alveolar lateral flap
 - ɦ Simultaneous ʃ and x
- Affricates and double articulations can be represented by two symbols joined by a tie bar if necessary.
- kp̪ ts̪

SUPRASEGMENTALS

- ˈ Primary stress
 - ˌ Secondary stress
 - ː Long
 - ˑ Half-long
 - ◌̥ Extra-short
 - ◌̥ Minor (foot) group
 - ◌̥ Major (intonation) group
 - Syllable break
 - ◌̆ Linking (absence of a break)
- ˌˈfəʊnəˈtɪʃən
- ɛː
- ˑ eˑ
- ◌̥ ɛ̥
- ◌̥ jɪ.ækt

DIACRITICS Diacritics may be placed above a symbol with a descender, e.g. ɲ̂

◌̥ Voiceless	◌̥	◌̚ Breathy voiced	◌̚	◌̣ Dental	◌̣
◌̣ Voiced	◌̣	◌̤ Creaky voiced	◌̤	◌̤ Apical	◌̤
◌̚ Aspirated	◌̚	◌̟ Linguolabial	◌̟	◌̟ Laminar	◌̟
◌̙ More rounded	◌̙	◌̙ Labialized	◌̙	◌̙ Nasalized	◌̙
◌̘ Less rounded	◌̘	◌̘ Palatalized	◌̘	◌̙ Nasal release	◌̙
◌̙ Advanced	◌̙	◌̙ Velarized	◌̙	◌̙ Lateral release	◌̙
◌̘ Retraacted	◌̘	◌̙ Pharyngealized	◌̙	◌̙ No audible release	◌̙
◌̚ Centralized	◌̚	◌̙ Velarized or pharyngealized	◌̙		
◌̙ Mid-centralized	◌̙	◌̙ Raised	◌̙		
◌̙ Syllabic	◌̙	◌̙ Lowered	◌̙		
◌̙ Non-syllabic	◌̙	◌̙ Advanced Tongue Root	◌̙		
◌̙ Rhoticity	◌̙	◌̙ Retracted Tongue Root	◌̙		

TONES AND WORD ACCENTS

- ◌̈́ Extra high
- ◌̈́ High
- ◌̈́ Mid
- ◌̈́ Low
- ◌̈́ Extra low
- ◌̈́ Downstep
- ◌̈́ Upstep
- ◌̈́ Rising
- ◌̈́ Falling
- ◌̈́ High rising
- ◌̈́ Low rising
- ◌̈́ Rising-falling
- ◌̈́ Global rise
- ◌̈́ Global fall

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