UNIVERSITY OF TURKU

Phonemic Transcription Symbols in EFL Teaching

Focus on Finnish Fourth Graders

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January 2026

Master's Thesis

Language Learning and Teaching Degree Programme, Department of English:
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Number of pages: 59 pages, 8 appendix pages

This thesis explores the use of phonemic transcription symbols in Finnish EFL teaching. Previous research has shown that pronunciation is an often-overlooked element in EFL lessons, and symbols of phonemic transcription even more so. This study set out to examine whether primary school English students in Finland recognise transcription symbols. Another aim was to measure how well they are able to produce the sounds corresponding to the symbols. The study also explored the use of transcription symbols in teaching and teachers' reasons for including these in or omitting these from lesson plans.

The study was limited to year four students of English, in seven primary schools in Southwestern Finland. There were a total of 68 analysed participants. Three sounds and symbols were chosen for the experiment: the sibilant /ʃ/, the fricative /θ/, and the affricate /tʃ/. The test participants were studied through a researcher generated protocol, where they were shown a two-part elicitation presentation. One part included pictures of words containing the sounds of interest, the other non-words containing the same sounds. Participant responses were recorded and then analysed acoustically.

The study also comprised an exercise book observation portion, where the completion rates were logged for four transcription symbol-based exercises in the participants' exercise books. In addition, survey answers were collected from teachers regarding the use of phonemic transcription in their teaching and motivations behind use or non-use.

The figures of central tendency from the elicitation tasks indicated that the participants were uniformly unfamiliar with the transcription symbols used in the non-words. They were, however, able to produce two of the three sounds with relative ease in the picture-based task. The sound /θ/ was noticeably more difficult than /ʃ/ and /tʃ/ in both tasks. The exercise book observation revealed that the completion rate of pronunciation exercises has a tendency to fall as the school year progresses. There was notable difference between the students of different teachers as well as variation in teachers' practices and opinions.

The main conclusion was that primary school students are not familiar with transcription symbols, despite having material related to them in their books and working on some of the material throughout the year. Another conclusion possibly yielding practical implications was that teachers tend to consider the use of phonemic transcription as extra content, and as such disposable when prioritisation is needed. Some form of reform regarding the use of transcription symbols in primary school EFL teaching appears to be needed, as the inclusion of these symbols in teaching materials appear currently not to be serving their purpose.

Key words: second language acquisition, pronunciation, phonemic transcription, curriculum, teaching materials

Table of contents

List of tables

List of figures

List of abbreviations

CEFR	Common European Framework of Reference for Languages
CLT	Communicative Language Teaching
EFL	English as a foreign language
EPTiES	English Pronunciation Teaching in Europe Survey
FL	Foreign language
IPA	International Phonetic Alphabet
ISLA	Instructed Second Language Acquisition
L1	First language
L2	Second language
LFC	The Lingua Franca Core
SLA	Second Language Acquisition
SLM	Speech Learning Model

1 Introduction

English has been dubbed the "third national language" of Finland and for a good reason. In present-day Finland, 97 per cent of primary school children study English as their first compulsory foreign language (FL) (Vipunen 2025). English as a foreign language (EFL) instruction is thus a fundamental element of Finnish compulsory education and consequently a major stakeholder in the teaching material industry. Finnish schools use commercially produced textbooks as their main teaching material, and this tendency is even more prominent in FL classes (Luukka et al. 2008, 94). Finnish EFL book series have a long tradition of including *phonemic transcription*, representing sounds by symbols, alongside regular English orthography: it has been used in book series at least since the 1970's (e.g. Webster et al. 1979) up until the newest series in print at the time of this study. Depending on the book series, transcription might be included in picture dictionary pages, vocabulary lists, as well as exercises dedicated to learning individual sounds, i.e. *segmental* features, or *suprasegmental* features, which encompass aspects such as stress and intonation. While the prominence of transcription symbols in Finnish EFL materials is evident, it is somewhat unclear what the purpose for including these is and whether the purpose is met.

The aims of Finnish EFL instruction on an institutional level are clearly laid out in the "objectives of instruction" in the curriculum. The Finnish Core Curriculum for Basic Education states that English instruction in schools should, for example, "guide the pupil to practice interacting in situations" and "to encourage him or her to continue regardless of possible temporary breaks in communication" (Finnish National Board of Education 2016). Were these to truly come into fruition, FL instruction would most likely foster a positive communicative approach towards using additional languages. In addition to these abstractions, the core curriculum also offers "key content areas related to the objectives of instruction". Here the curriculum mentions practicing pronunciation and the rhythm of speech, for example. It also states that students should "practice recognising the symbols of phonetic transcription in English". The core curriculum mentions *phonetic transcription*, a system distinguishing between subtle differences in sounds with the use of diacritics, but we can assume they in fact refer to phonemic transcription, a broader transcription system which will be discussed in greater detail in section 3.3 below. Textbook publishers include the symbols in their books as mandated by the curricula, and it seems the curricula might include these as they have a long-standing tradition in textbooks. Finnish primary school EFL

textbooks have included phonemic transcription in vocabulary lists and exercises decades before an explicit mention was added to the core curriculum (Webster et al. 1979, Heino et al. 1986, Kouluhallitus 1985, Finnish National Agency for Education 1994, Finnish National Agency for Education 2016). This may be a case of circular reasoning and something which perhaps ought to be evaluated critically. One would, after all, expect each content area mention ideally to be based on extensive research and at the very least evidence stemming from long-standing practical experience.

Teaching of English pronunciation and the use of phonemic transcription therein have been studied both in Finland and in the international context, but there appears to be few if any research findings supporting the inclusion of phonemic transcription in primary school teaching materials and curricula. In Finland Lintunen and Tergujeff have looked into the use of phonemic transcription, studying for example advanced Finnish learners of English (Lintunen 2004) and reporting on the Finland based responses of the English Pronunciation Teaching in Europe Survey (EPTiES) (Tergujeff 2012). The current study investigates the use of transcription symbols in Finnish EFL teaching, building on the findings on Lintunen and Tergujeff, among others. Here the focus is on primary schools, and the aim is to see whether the symbols of phonemic transcription are used in EFL classes, and whether students indeed learn these.

The current study addresses the following research questions:

1. How proficient are students in recognising transcription symbols presented in their exercise book and producing the corresponding sounds?

2. To what extent are transcription symbols used in teaching English pronunciation?

3. What are the reasons behind teachers opting to use or not to use transcription symbols in teaching?

This study falls under the field of Second Language Acquisition (SLA) studies, or more specifically under Instructed Second Language Acquisition (ISLA). Where SLA is concerned overall with the capacity of learning additional languages after ones first language or languages have been acquired (Ortega 2009, 2), ISLA considers instructional interventions in language learning (Kennedy and Trofimovich 2017, 260). The current study explores teaching practices and the use of teaching material, which can be seen as instructional interventions. The language classroom is, after all, “[t]he prototypical context for ISLA” (Loewen and Sato

2017, 2). In a larger framework, the current study can also be seen to fall under the fields of education, applied linguistics, and phonetics.

This thesis will start with an overview of pronunciation in second language (L2)[1] or FL[2] learning, presenting some external and internal factors which are known to influence the process. After this, teaching of pronunciation will be looked into from the points of view of teachers, the curricula, and FL textbooks and the relationships between these. Next, the focus will be on transcription as a teaching method, taking into account both the use and usefulness of it. After the theoretical background has been presented, the present study will be introduced. This section will present the sounds of interest, the material, and participants. Data collection and analysis will also be examined in detail, before moving on to the results of the study. Finally, the results will be discussed and placed into the context of previous studies. Possible future implications will also be considered.

[1] In this thesis the term second language (L2) is used when generally referring to additional languages learnt after ones first language, such as in the case of Second Language Acquisition studies.
[2] In this thesis the term foreign language (FL) is used when referring to languages which are not a learner's first language nor an official second language in the region, such as the case of English in Finland.

2 Pronunciation in second language learning

Language learning and learning pronunciation in particular are multifaceted phenomena. There are several factors which are considered to affect language learning and which have received ongoing scholarly attention. Some of the most prominent factors will now be briefly presented.

Factors and influences which affect the L2 learning process and ultimate attainment have been divided into universal and individual (e.g. Ortega 2009, 9) or alternatively into learner-external and learner-internal factors (e.g. Loewen and Sato 2017, 6). Celce-Murcia et al. ([2010] 2017, 20) note that in terms of the acquisition of L2 phonology, the network of factors is "tremendously complicated" and functions on several levels.

External factors have been said to include the social contexts in which learning takes place, both at a micro and macro level (Loewen and Sato 2017, 6). Benson (2021) sees learning environments as all the interactions between language learners and their surroundings. The current study looks at the traditional, physical learning environment of a language classroom. The makeup of the classroom learning environment can be seen as a variable here, with different teachers, teaching styles and diversity among students contributing to the differences between tested groups of students.

Internal factors, on the other hand, include language aptitude and motivation, for example (Ortega 2009, 9). Motivation has been studied by Gardner (1985) and Dörnyei (2003), among others. Celce-Murcia et al. ([2010] 2017, 20) note that even personalities play a role in learning L2 pronunciation, and Loewen and Sato (2017, 6) add language anxiety to the list of internal factors. These factors and influences "moderate and influence the effectiveness of instruction" (Loewen and Sato 2017, 6) and as such deserve due attention in ISLA studies. Due to restrictions of space and scope, learner internal factors lay outside the reach of the current study, however.

Universal influences which have been shown to affect the process of L2 learning include age and first language (e.g. Ortega 2009 and Ellis 2008). These will now be examined and commented on, from the point of view of learning pronunciation.

Age is an important factor in language learning: children, especially, are known to often excel in languages (Ullakonoja and Dufva 2017, 32). Pronunciation may be an aspect of language learning where age plays a specifically notable role. According to Celce-Murcia et al. ([2010]

2017, 278) "[a]ge is a key factor since emphasizing accurate production early may prevent fossilized pronunciation later on." After one has acquired their first language, their use of the physical speech production system can be seen to have reached a certain state of routine (Ullakonoja and Dufva 2017, 22). If *fossilisation,* a halt in improvement in learner language, is to be avoided and adequate physical routines for L2 pronunciation built, appropriate and effective pronunciation instruction is needed early on. Policy makers, teaching material publishers, and teachers must take into consideration the age groups they are dealing with and carefully assess the type and intensity of instruction appropriate for each.

Language learner's first language or languages are another widely acknowledged factor affecting L2 learning. *Contrastive analysis* of languages is an approach from the 1960's and 70's which takes into consideration the effect of the first language (L1) on additional languages. Robert Lado ([1957] 1971, 11) created a framework wherein the sound systems of languages (L1 and L2) are compared systematically, and differences in systems are expected to negatively affect the learning process. According to him, the sound system of one's native language is so strong that it is difficult to change anything in it. He also suggested that language learners transfer native phonemes into the L2. This view, albeit influential, is problem-oriented and as such overlooks potential positive influences language knowledge may have on additional language acquisition. Celce-Murcia et al. ([2010] 2017, 22) point out that the model is also unable to predict the level of difficulty with a given item.

The effect of one language on another, *transfer*, has come to be viewed as a more complex process in recent decades. Vivian Cook (2003, 11) notes that cross-linguistic effects can take place between the L1 and L2 in both directions and be positive, negative or neutral in nature. Similarities in L2 and L2 phonological systems, for example, could be expected to have a positive effect on learning pronunciation.

Flege's (1995) Speech Learning Model (SLM), similarly, is based on a contrastive view. Contrarily to Lado, he also comments on the levels of difficulty one might experience. He saw that through contrastive analysis sounds of a new language could be divided into three distinct levels of difficulty. Sounds which are identical in both the L1 and the L2 pose the least difficulty, whereas completely new sounds may be difficult especially initially and in terms of production. Sounds which are similar yet distinct, on the other hand, are the most difficult and may cause no problems in both perception and production (ibid.). SLM has been used in Finland, for example, in choosing the stimuli for Näätänen et al.'s (1997) seminal paper on

phoneme representations and brain responses, as well as Peltola et al.'s (2015) study on non-native production training. The stimuli for the current study have likewise been selected with SLM in mind. Kennedy and Trofimovich (2017, 261) remark that whilst SLM is often used as a "conceptual backdrop" for research, the predictions of SLM have rarely been examined for the purposes on pronunciation teaching. Herein lies a perhaps untapped possibility for practical implications.

The focus will now be turned to pronunciation teaching, before moving on to the current study.

3 Teaching pronunciation

In the context of formal language learning, teaching is mostly explicit. Classroom realities rarely permit adequate language input for more natural acquisition, thus necessitating an approach where students are provided with theoretical knowledge and carefully selected input. Since the dawn of Communicative Language Teaching (CLT) in the 1960's, however, language instruction has been adopting a more communicative approach (Celce-Murcia et al. [2010] 2017, 11). In CLT, communication and interaction are seen as both the medium and the target of language learning. Attaining adequate skills in spoken language, often regarded as the primary form of language, is therefore a justifiable goal in L2 acquisition. It is thus clear that pronunciation must be taught and learnt to some extent in order to communicate efficiently in the target language. Lintunen (2004, 221), for example, calls for explicit pronunciation instruction, and instruction in oral skills is indeed mandated by current core curricula in Finland (Finnish National Board of Education 2016).

When pronunciation is taught, a consensus is not always reached on whether to concentrate on suprasegmental or segmental features (the broad or the narrow approach). The emphasis in teaching has first shifted from segmental to suprasegmental and then towards a balanced view, which recognises that problems in communication can be caused by both types of features (Celce-Murcia et al. [2010] 2017, 11). The current study adopts a narrow approach in studying the acquisition of individual sounds and corresponding symbols. This choice stems from the research questions: in order to study how well transcription symbols and corresponding sounds are known, a segmental approach is needed.

The following section will take a look at pronunciation teaching, examining the interaction between the curriculum, textbooks, and teachers.

3.1 Teachers and the curricula

In Finland, teaching is regulated by National Core Curricula published by the Finnish National Agency for Education. The Finnish National Agency for Education has also devised an adaptation of the Common European Framework of Reference for Languages (CEFR) for use in language teaching (Finnish National Board of Education 2025). The National Core Curriculum for Basic Education defines the skills required for certain grades based on descriptions in the CEFR (ibid.). Finnish schools can thus be seen to base their teaching and assessment on the CEFR, in addition to core and local curricula.

Pronunciation skills are mentioned in the CEFR and the core curricula, as well as in local curricula (e.g. City of Turku 2016). The curriculum that the participants of this study followed was the National Core Curriculum for Primary and Secondary Education, published in 2014 and implemented in 2016. It states under the A syllabus in English in grades 3–6:

> The pupils observe and get plenty of practice in pronunciation, stressing words and sentences, the rhythm of speech and intonation. They practice recognising the symbols of phonetic transcription in English. (Finnish National Board of Education 2016.)

Emphasis here seems to be on suprasegmental features. However, segmental features are alluded to as well, with the mention of phonetic transcription. The explicit mentions to pronunciation made in the core and local curricula inevitably indicate that pronunciation should be an integrative part of EFL content.

The CEFR (Council of Europe 2001) deals mostly with the concepts of accent and accuracy, when handling pronunciation. The CEFR Companion Volume (Council of Europe 2017), on the other hand, encompasses a detailed section on "phonological control" and shifts the focus onto intelligibility, thus adopting a view more aligned with the principles of CLT. New descriptors also include phases such as "Systematic mispronunciation of phonemes does not hinder intelligibility". If systematic mispronunciations of phonemes are to be avoided, explicit instruction in segmentals is surely needed. As we have seen above, both the core curricula and the CEFR mandate pronunciation teaching. It is, however, unclear whether classroom realities along with teachers' skills and attitudes permit actual execution thereof.

Teachers should acquire the basic know-how for their profession through their university training, yet according to the EPTiES this does not appear to be the case when it comes to teaching pronunciation (Henderson et al. 2015 and Tergujeff 2012a). Teachers feel they have received sufficient training in their own pronunciation but have not been taught how to teach pronunciation (Tergujeff 2012a, 34). Henderson et al. (2015, 282) refer to teachers in the European context as "amateurs in terms of teaching pronunciation", as they appear to be mostly self-taught in this respect. This raises questions regarding the level of pronunciation instruction in schools both in Finland and abroad.

The current study looks into one aspect of pronunciation teaching, namely instruction related to transcription, in seven different schools. If the situation has remained unchanged since the

EPTiES, it can be expected that amounts and styles of pronunciation teaching are not consistent between schools, and the topic may be all but overlooked in some.

3.2 The role of textbooks

This section will examine another major factor in teaching pronunciation, EFL textbooks. Where curricula and teacher training are institutional components, textbooks are corporate. Textbooks are also always connected to the social context, and they bring forth ideologies, such as those related to current language policies and scientific theories (Dufva & Mäntylä 2017, 102). In Finland, EFL textbooks are published by commercial companies and based on current core curricula. The interaction between textbooks, teachers and the curricula can be seen to form a three-level hierarchy. A governmental body, The Finnish National Agency for Education, at the top of the hierarchy outlines the core curricula. The publishing sector then translates the curricula into actual teaching materials. What and how teachers teach can thus be assumed to be influenced by publishers' choices, leaving teachers at the bottom of the hierarchy but with all the implementation responsibility.

The role of textbooks may be especially pivotal when it comes to FL teaching, as textbooks are relied upon heavily in the field. A study by Luukka et al. (2008, 94) reports that 98 per cent of FL teachers said they often use textbooks and 95 percent that they often use the accompanying exercise books. It should be noted, however, that there are indications towards pronunciation content not being presented in an ideal way in EFL materials, especially in older series. Tergujeff (2013, 85) asked her pupil informants to point out pronunciation exercises from their English books, but many struggled to find them, as they did not seem to be a frequent topic in the books. Material related to pronunciation tends to be presented as something extra in teaching materials: it might be presented in a box on the side, at the end of chapters, or even at the end of the book. This may lead to it being considered supplementary in nature (Tegujeff et al. 2017, 100), contradictorily to what the core curriculum asserts. Newer English textbook series published in Finland, such as Sanoma Pro's *Come with me*! (series completed in 2024) and Otava's *Skylight* (series to be completed in 2027) have included pronunciation exercises in their materials, and they are presented fairly equally throughout the book (Harjula et al. 2021 and Logan et al. 2023). This should encourage teachers to consider them a central topic in teaching and thus something that should not be overlooked.

In Finnish EFL textbooks, the majority of pronunciation activities have been found to be fairly traditional, including phonetic training, reading aloud, and listen and repeat (Tergujeff 2010, 201). Tergujeff's (2012b, 603) classroom observations likewise revealed that the vast majority of pronunciation teaching was of a traditional type, with only isolated instances of rhyme or tactile reinforcement use, for example. Pronunciation can, however, be taught with a plethora of different types of exercises, some of which are more traditional, whilst others are innovative, with possible utilisation of modern technology. Ullakonoja and Dufva (2017, 32), for example, recommend implementing methodologies such as movement and play based learning into pronunciation curricula.

Phonetic training and deciphering phonemic script are also possible activities in EFL classrooms. The *Come with me*! series, for example, includes exercises where transcription symbols are used. At present, there is no research data available as to whether teachers in Finland include these transcription-based materials in their teaching, and whether they serve their purpose. The current research aims to shed light on this. The following section will take a closer look at transcription as a teaching method, taking into consideration the relationship between orthography and sounds, the question of the appropriate age for introducing phonemic script, as well as students' and teachers' points of view.

3.3 Phonemic transcription

In the context of EFL textbooks, phonemic transcription refers to adaptations of the International Phonetic Alphabet (IPA). Grossly simplified, the basic principle for transcription is that each distinctive sound is represented by a separate symbol (Mompean 2015, 295). EFL teaching materials generally use broad, or phonemic transcription, which is written inside slant brackets (Cruttenden 2014, 50). Broad transcription is seen as more appropriate for language learners, for example when needing to check the pronunciation of a word in a dictionary (Reetz and Jongman 2009, 23).

Many of the IPA symbols correspond to letters in the Roman alphabet and are as such familiar to Finnish learners of English. Transcribing English, however, also requires symbols which are not from the Roman alphabet, as English does not have a simple *phoneme-grapheme correspondence*, that is, each sound is not represented by a separate letter (Reetz and Jongman 2009, 27 and Celce-Murcia et al. [2010] 2017, 51–52). Both consonants and vowels include symbols which are somewhat foreign as compared to the Roman alphabet. The vowel sound schwa /ə/, for example, is one of these. Perhaps the most distinct are the symbols used for

sounds which in English orthography are represented by the digraph <th>, namely the theta symbol /θ/ for the voiceless interdental fricative, and the eth symbol /ð/ for its voiced equivalent. The symbol for the voiceless postalveolar fricative /ʃ/ and its voiced counterpart /ʒ/ also bear little resemblance to their usual orthographic representations.

From a contrastive point of view, native Finnish speakers can be expected to find both the system of transcription and some of the English transcription symbols fairly easy. Finnish has an almost completely direct sound-symbol correspondence (Hakulinen et al. 2004, 40), ergo the principle of one sound per one symbol is already familiar to Finns. Many of the Roman symbols used in English transcription also feature in the Finnish phoneme inventory and alphabet. The difficulty in using transcription in EFL studies therefore mainly lies with the non-Roman symbols and conventions related to suprasegmentals.

Where transcription may seem logical to Finns, English spelling might be experienced differently, especially in early years of studying the language. Students who are used to strong phoneme-grapheme correspondence are known to sometimes experience interference from their native writing system (Tegujeff et al. 2017, 110 and Celce-Murcia et al. [2010] 2017, 419). This does not necessarily mean that a student would not know a certain sound, merely that they make faulty deductions based on the foreign orthography (Ullakonoja and Dufva 2017, 29). Tegujeff et al. (2017, 110) suggest that transcription solves this problem. This does seem plausible, for example in cases of silent letters or sounds which do not have a corresponding grapheme in the student's first language. There is, however, the challenge of having to master the new symbols in order to actually make use of transcription. The focus will turn next to the use of transcription as a teaching method in EFL classes, first through examining whether transcription is used in teaching and then by addressing the critical question of whether it is indeed useful.

3.3.1 The use of phonemic transcription

According to the core curriculum, students are required to practice recognising transcription symbols in English classes from year 3 onwards (Finnish National Board of Education 2016). No mention is made regarding other uses of transcription, nor is it explicitly stated that students would be expected to be able to produce the sounds related to the symbols, at least at this stage. Local curricula likewise make no further elaborations on the aim (e.g. City of Turku 2016). It is therefore evident that EFL teaching is expected to include transcription symbols at least to some extent, but the actual purpose of these remains somewhat vague.

Finnish EFL teaching material appears to abide by the core curriculum, in that transcription symbols are widely used across series. In an analysis of 16 Finnish EFL textbooks, exercise books, and teacher's guides, phonemic transcription was found to have "a strong foothold" (Tergujeff 2010, 189). In the early 2000's, the situation was similar: Lintunen (2004, 188) notes that transcription symbols were likewise widely used in schoolbooks. It should be noted that while there is a presence of transcription in textbooks, this cannot be taken as a direct indication regarding teaching practices.

Previous research has shown that transcription has not been commonly used in pronunciation teaching. Some 20 years ago 76.9 per cent of university students reported that they had not been taught transcription symbols at lower levels of school, reflecting the situation in Finnish schools during the 1990's (Lintunen 2004, 187). A Finnish case study from 2012 yielded similar results, out of four observed teachers, only one explicitly used transcription in teaching, and this was an upper-secondary school teacher (Tergujeff 2012b). The primary school teacher who was observed in the study did not use transcription at all (ibid.). Similar findings are presented in a recent case study from Polish state schools: Out of three teachers only one used transcription in their teaching (Jarosz 2023, n.p.). These findings point towards transcription not having been widely used in EFL teaching, whilst we must naturally note that findings of case studies and small samples cannot be generalised. The current study investigates whether the situation remains unchanged, or whether transcription has gained more of a foothold in teaching practices in recent years following the addition of the explicit mention into the core curriculum.

The current study also examines reasons behind teachers using or not using transcription in their English lessons. In the Polish context Jarosz' informants claimed not to have time to teach transcription and also mentioned other content being more important (Jarosz 2023, n.p.). Perceived difficulty is also a factor: transcription systems and symbols are often considered difficult by teachers and students alike (Mompean 2015, 294). This may naturally result in an aversion towards teaching and learning the symbols. Additionally, insufficient training can contribute to the avoidance of transcription in teaching (ibid.).

Another factor which can contribute towards the inclusion or omission of transcription from lesson plans is the age of students. This, interestingly, is not something taken into consideration in the Finnish core curricula, where familiarity with transcription is expected from age 9 onwards. Henderson et al. (2015, 271) note that teachers might be more prone to

teaching transcription symbols to older learners. On the other hand, it can also be seen as futile when learners are older, and pronunciation might already be fossilised (ibid.). Ullakonoja and Dufva (2017, 32) do suggest transcription might be appropriate for upper-secondary and adult students, and Celce-Murcia et al. ([2010] 2017, 420) claim that for young learners "the introduction of the phonemic alphabet is unnecessarily burdensome". There does not appear to be any straightforward answer to the correct age at which to introduce transcription, based on teachers' opinions or researchers' views.

3.3.2 The usefulness of phonemic transcription

The usefulness of transcription as a teaching method is a controversial issue, yet one that does not receive wide attention. As transcription symbols are mentioned in curricula, and textbook publishers include transcription symbols in their books year after year, one would expect there to be ample research supporting their usefulness. This is, nevertheless, not the case. This raises the question whether transcription is included in curricula and teaching materials merely as a convention, or whether it actually serves its purpose. This issue will be addressed next, by examining teachers' and students' views on usefulness of transcription, as well as findings of studies related to the topic.

There appears to be a consensus about the usefulness of utilising transcription in university studies and research, but not when it comes to language lessons in schools (Mompean 2015, 292). Finnish teacher respondents in the EPTiES gave opposing views regarding the teaching of transcription symbols, with some considering it an essential skill and others a cause of confusion (Tergujeff 2012a, 42). European respondents, likewise, were divided in their views: one suggested that knowing transcription promotes independence and ability to find out correct pronunciations for words, whereas another simply stated that transcription is not "an efficient way" of teaching pronunciation (Henderson et al. 2015, 272). The disparity in views might suggest that there is considerable difference in the amount and quality of transcription instruction students receive, as a consequence of the differing views teachers hold regarding the topic.

Advanced EFL university learners in Finland and abroad appear to find transcription symbols useful for learning pronunciation and have positive views towards transcription (Mompean 2015, 301 and 307 and Lintunen 2004, 185). These students had received training in transcription and were adult learners of English. This brings us back to the question of age: transcription may indeed be a useful tool in teaching and learning English but perhaps not

uniformly for all ages. Tergujeff's (2013, 88) informants were Finnish pupils aged 10–18 and they had opposing views with one another. Thus, we can deduce that at least amongst under 18s, transcription is not viewed consistently as positive.

Teachers' and students' views on the usefulness of transcription are certainly interesting and may be connected to teaching and learning motivation. Findings regarding the connection between transcription and pronunciation skills, however, are perhaps even more relevant when it comes to evaluating the usefulness of transcription as a teaching method. Previous research has indicated there might be a connection between transcription skills and improved pronunciation (Lintunen 2004) and even that pronunciation may be aided by the mere presence of transcription (Peltola et al. 2015). It should be noted that both of the abovementioned studies had adult respondents. There are no studies available regarding the connection between knowledge of transcription symbols and pronunciation skills in primary school aged children in Finland. Considering this, it is interesting how explicitly transcription is included in curricula and textbooks.

Whilst findings supporting the usefulness of transcription in learning pronunciation would be desirable, a minimum requirement could be the presence of data suggesting that including transcription in teaching does not, at least, hinder learning. It is positive that there is no evidence suggesting that the presence of transcription in teaching would have a negative effect on children's written language skills (Tergujeff et al. 2017, 106). Children are not known to, for example, confuse transcription symbols with graphemes (ibid.).

In their study with adult informants Peltola et al. (2015) found that when an acoustic model is available, an added transcription cue either steers production in the correct direction or at least does not interfere with learning. They found an orthographic cue to have the opposite effect on adult subjects (ibid.), whereas with children no such effect was present (Immonen et al. 2023). This suggests that age, again, is an important factor. There was no test where children trained with a transcription cue, so no data is available on how children would have reacted to the presence of transcription.

If Peltola et al.'s (2015) subjects developed their pronunciation in the direction of the acoustic model with the aid of the transcription cue, an interesting question arises. The subjects were not trained in the language being studied, nor did they have previous training in transcription (ibid.). If the transcription cue helped them follow the acoustic model with greater accuracy regardless, the presence of transcription could be deemed useful, even when students do not

know the symbols. A foreign symbol in a transcription cue could signal that the sound is new and prompt the student to pay closer attention to the acoustic model. For EFL students this could be useful when encountering words with completely new sounds, such as interdental fricatives /θ/ and /ð/.

We have seen in this section that despite being widely present in EFL textbooks, transcription has not been used much in EFL lessons. Reasons for using or not using transcription have also been presented. The usefulness of transcription as a teaching method has been discussed, but no consensus reached. Both teachers and younger students seem divided in their opinions on the subject.

4 The present study

In this section the present study will be introduced. The study aimed to answer three research questions, borne out of the literature and previous research presented above. Firstly, the aim was to gain more understanding on how proficient students are in recognising transcription symbols and producing the corresponding sounds. Reasons behind teachers opting to use or not to use transcription symbols in their teaching were also examined.

Below, the target sounds, material, and test participants will first be presented. Then the test itself will be discussed, with sections on the elicitation tasks, exercise book observations, and the teacher survey.

4.1 Sounds of interest

In this section, the sounds of interest for the current study will be introduced and described, from contrastive and communicative points of view.

Three sounds of interest were chosen for the current study: the voiceless palato-alveolar sibilant /ʃ/, the voiceless interdental fricative /θ/, and the voiceless affricate /tʃ/. There were three main criteria, based on which the sounds were chosen. These will be presented below.

Firstly, the transcription symbols for sounds were considered. The chosen sounds needed to have symbols which differed as much as possible from their orthographic counterparts. As many of the IPA symbols are based on the Roman alphabet (Cruttenden 2014, 49), they can be intuitively connected to sounds. In order to truly test how well the participants recognised the symbols, they needed to be ones that could not be straightforwardly guessed.

Fricatives and affricates were attractive groups of sounds for the purposes of this study, as they include several sounds whose symbols are not from the Roman alphabet. The chosen sounds and corresponding symbols, /θ/, /ʃ/ and /tʃ/, were all deemed sufficiently distinct from their orthographic counterparts, to meet the criteria for this study. All three of the chosen sounds also feature on Lintunen's (2004, 149) list of sounds which were problematic in a transcription task. This could be related to their dissimilarity compared to Roman graphemes.

Secondly, the sounds chosen needed to be ones which are known to cause difficulty for Finnish learners of English. English fricatives include several sounds which fit this criterion (Morris-Wilson 2004, 57). The three sounds chosen for this study could all be seen as new or

at least marginal sounds for Finns and as such difficult (Flege 1995). It should be noted, however, that Finnish has adopted /ʃ/ and /tʃ/ into some loan words but with very restricted and limited distribution (Hakulinen et al. 2004, 40).

The assumption of difficulty presented above is supported by the findings of Lintunen, in his error analysis. He notes that Finns are prone to more trouble with consonants in English, than they are with vowels (Lintunen 2005, 380). The five sounds causing the most common and consistent pronunciation problems in his analysis were all consonants and new sounds to Finns. Among these are two of the three sounds of interest of this study: the fricative /θ/ and the affricate /tʃ/ (Lintunen 2004, 216).

The sounds /θ/, /ʃ/ and /tʃ/ are interestingly also sounds which native speakers acquire relatively late, approximately between the ages of 6 and 8 (Core 2012, 83). This can be seen as a factor in their difficulty; If native speaker children struggle with these sounds, they are likely also challenging for young FL learners.

An opposite approach to difficulty was taken when choosing between voiced and voiceless sounds. There is no fortis/lenis opposition in the Finnish sound system (Morris-Wilson 2004, 44) and voicing can consequently be difficult for Finns to master in EFL studies. As the test participants were primary school aged and thus at the beginning of their English studies, voicing was considered too difficult an aspect for this age group.

Finally, the communicative approach was given some consideration. The Lingua Franca Core (LFC) is one way to evaluate the importance of sounds in EFL. The phonological core is based on a large and diverse data set whence four “most important areas for the preservation of mutual phonological intelligibility” were identified (Jenkins 2000, 132). In this list, “most consonant sounds” are listed as the first feature, followed by consonant cluster simplification, vowel length distinctions, and nuclear stress (ibid.). It can thus be deduced that consonant sounds are integral to intelligible communication in English. Accordingly, consonants were chosen as the sounds studied here.

The interdental fricative /θ/ is not a sound included in the LFC, and Jenkins notes that there were no cases of phonological unintelligibility in her material, when /θ/ was substituted with another sound (Jenkins 2000, 137). Despite this limitation, the voiceless interdental fricative was included in this study due to otherwise fitting the set criteria, as illustrated above, in a way that other alternatives would not have.

The choice of sounds stipulated the age of the test participants. The children taking part in the study needed to have studied the target sounds during the current year, in order for testing to be sensible. For this reason, the study was limited to year four students. The book series chosen for this study will be presented next and the use of transcription symbols in said series examined.

4.2 Material

To stabilise the data collection process and to make the findings comparable within the sample, the research was limited to the users of one EFL textbook series. Sanoma Pro's newest primary school EFL series *Come with me*! was chosen for this purpose. It is the newest completely finished EFL series by major Finnish publishers, and as such was expected to be in use fairly widely. The current study was devised based on materials found in the aforementioned series, and participants were recruited from schools which use these books.

The *Come with me*! exercise books (e.g. Harjula et al. 2023 and Harjula et al. 2021) feature a variety of exercises, as well as vocabulary lists for each chapter, with columns of English, Finnish, and phonemic script. They also include a designated series of exercises for studying pronunciation and phonemic script. At the end of each chapter, there is a section called "sounds". The sounds exercises typically present some sounds as transcription symbols, together with example words, and a rhyme or a tongue twister containing said sounds. There are also sound recognition exercises and listen and repeat tasks. The sounds sections deal mostly with individual sounds, i.e. they adopt a segmental, or narrow approach. The teacher's manuals give meagre instructions regarding the sounds exercises in general. They merely state that "the sounds exercises are used to practice English pronunciation", followed by two sentences describing the order in which tasks are to be done (Kiiso 2023, 16). Individual exercises include also short descriptions of the target sounds and desired tongue positions (e.g. Kiiso 2023, 40). There are some transcription-based exercises outside the sounds sections, as well, but no more than three per book.

English sounds and corresponding transcription symbols are presented with varying breadth in the series; some are introduced only once overall, whilst others are featured twice per year and in several books. The target sounds for the current study are first introduced explicitly in the year three book, each sound once in a sounds exercise. These are reintroduced in the year four book, /θ/ twice in a sounds exercise, and /ʃ/ and /tʃ/ once each. Year four was chosen as the target age group for the current study, since by the end of the school year, the students will

have been introduced to all three target sounds at least twice in the sounds sections. They will have additionally encountered them several times in other transcription exercises, as well as vocabulary lists.

4.3 Participants

4.3.1 Schools

Research permits were obtained from four municipalities in Southwest Finland: one major city, two surrounding municipalities, and one rural municipality. After obtaining research permits from the appropriate bodies, contact was made with over 30 schools. Reaching the right people required immense work, just under 100 phone calls were made and over 70 emails sent to school secretaries, heads of school, class teachers, and English teachers. At the time when data collection was due to begin, seven schools had agreed to take part in the study. There were one or two participating classes from each school and likewise one or two teachers per school. In total, 11 classes and 10 teachers took part.

The schools, whilst all being from Southwest Finland, were considerably diverse: they were from different sized municipalities, both urban and rural. One school was a state owned, university affiliated teacher training school, and the others municipality owned and governed schools, as is the norm in Finland. Sizes of schools varied too, with the number of students ranging from 50 up to nearly a thousand.

In terms of socio-economic profiles, there was ample diversity in the pool. Studying Finnish as a second language is considered a factor in academic performance and consequently catchment area segregation (Peltoniemi and Seppälä 2023). One participating school had 0 per cent Finnish as a second language students, one had 62 per cent, and the others between 4 and 32 per cent (Yle 2023). In the catchment areas, the number of residents with tertiary education degrees varied between 13 and 34 per cent, and median income between about 1500 euros and just over 2000 euros, i.e. on both sides of the country wide median income, with a slight lean towards the lower end of the spectrum (ibid.)

Based on the demographics above, it can be stated that whilst the number of schools involved was limited, there was considerable diversity in their profiles. Tergujeff (2012b, 601) noted that involving both bigger and smaller schools is desirable, as the difficulty of pronunciation teaching is sometimes attributed to the size of the teaching group. In the current study

teaching group sizes varied between eight and over 20. Some schools delivered English lessons as split class session, so that only half of the students were present at a time.

The sample of the current study has features of both probability and nonprobability sampling (Wagner 2011, 24). The aim was to study a sample from the population of fourth grade A syllabus English students using the *Come with me*! series.

The diversity in partaking school profiles is a factor contributing towards having a truly representative sample of the population; a good sample mirrors its population in its key characteristics, such as age, gender and socioeconomic status (Dörnyei 2007, 96). The current study had variety in the pool of participants, but naturally the self-selection bias can be expected to have affected the actual sample, as participants were recruited with an opt-in protocol (Dewaele 2018, 271).

Additionally, as research was limited to schools willing to take part in the study and schools within a reasonable geographic distance, there are aspects of nonprobability sampling, also referred to as convenience sampling, present as well (Wagner 2011, 24).

4.3.2 Students

Student participants for the study were recruited with an online message delivered to all students in participating teaching groups, a pool of approximately 200 students. The parents or guardians of willing participants gave their consent via an online consent form, delivered through the Webropol survey tool. The consent form was used to obtain the written consent for participation and for collecting essential background information. Information collected comprised the first language of the student and presence of any speech or reading impediments. All partaking schools were co-educational, but gender was not asked, as it was not a factor of the current analysis. Names of the student and the guardian as well as the school and the class of the student, were also collected, but these formed no part of the analysis.

On the day of testing, verbal consent was obtained from participants. A total of 69 students were tested. Participants with speech or reading impediments were excluded prior to testing. One student was erroneously tested despite having disqualifying speech trait, and their production was consequently excluded from the data prior to the analysis phase. Thus, the final number of participants was 68.

4.3.3 Teachers

A total of 10 teachers responsible for teaching English to the partaking classes were included in the current study as test participants. Seven teachers taught only one class taking part in the study, and three taught two classes (or students from two classes in a combined split class lesson).

Information regarding teachers' education background, current job title, or gender were not collected, as these were not factors in the research questions of the current study. Based on discussions with the teachers, it appeared that the sample included both primary education class teachers and qualified EFL teachers.

4.4 Data collection

4.4.1 Elicitation tasks

A two-part elicitation task was devised in order to answer the first research question "How proficient are students in recognising transcription symbols presented in their exercise book and producing the corresponding sounds?". The research design related to the elicitation tasks will be presented below.

Elicitation tasks are a way to ensure that all the target sounds are sampled (Core 2012, 84) and thus seemed an appropriate method for the current study. The aim in the current study was to get children to produce the target sounds, both by producing the names of familiar vocabulary items and by interpreting phonemic script.

Standardised, norm-referenced phonology assessments are commonly used, but researcher-generated tasks are also used in studying child language (Core 2012, 85–86). Researcher-generated tasks in which children name objects, have been used for studying both typically developing children and children with speech impairments (Munson, Edwards, and Backman 2005 and Yavas and Barlow 2006). The current study similarly uses a researcher-generated protocol.

4.4.2 Picture prompt task

A picture prompt task was used to elicit examples of the sounds of interest and other sounds necessary for analysis. The aim of the picture prompt task was twofold: to evaluate the

production of the target sounds as compared to auditory and acoustic criteria, and to provide a reference point for the sound productions in the transcription prompt task.

Picture prompt or picture-naming tasks are used in elicitation tasks, in linguistic phonetics studies as well as speech disorder studies, both in international and Finnish contexts. Munson, Edwards, and Backman (2005) used a non-norm-referenced Phonetic Inventory test with a picture-naming task and Yavas and Barlow (2006) used a picture-naming task to study bilingual children's #sC clusters. Kunnari, Savinainen-Makkonen, and Saaristo-Helin's (2012) *Fonologiatesti*, The Finnish Test for Phonology, is a picture-naming task used to evaluate the phonological development of Finnish-speaking children and to diagnose phonological disorders. Martikainen, Savinainen-Makkonen, and Kunnari (2019) studied intra-word variability using pictures from the Finnish Test for Phonology in their picture naming task with children aged 3–6 years.

In the current study, the picture prompts were meticulously chosen, as instructed by Hughes (2011, 149). The aim was to ensure the presence of desired sounds in desired positions, and the inclusion of words which have previously been presented in the *Come with me*! series. Attention was also paid to the pictures being as unambiguous as possible. Each target sound was included three times, to better the odds of obtaining a sample of each sound from each participant.

The picture prompt task in the current study included 13 pictures, in colourful, cartoon-style renditions (please see appendix 1). The pictures were obtained from royalty free stock photo and illustration services. The picture prompt task comprised one example word, nine target sound words, and three reference sound words. The reference sounds /s/ and /t/ were elicited to enable comparison between test participants' productions of the target sounds /θ/, /ʃ/, and /tʃ/ with expected replacement sounds /t/ and /s/. Yavas and Barlow (2006, 185) similarly elicited singleton /s/ sounds to compare productions in their consonant cluster study.

The twelve target words met the following criteria: easily depicted nouns, presented in year 4 or earlier years of the *Come with me*! book series, containing sounds /θ/, /ʃ/, /tʃ/ in word-initial or word-final positions. Munson, Edwards, and Backman's (2005, 66) Phonetic Inventory test likewise used drawings of familiar words to elicit consonants in initial and final position. It should be noted as a possible limitation that the target sounds are not evenly distributed: each target sound is presented thrice, twice in one position and once in the other. Balancing the

positions would have resulted in a longer test protocol, which was deemed a risk for participant concentration.

The words selected for the current study are presented in table 1.

Table 1. Words used in the picture prompt task.

Word	Sound of interest	Target/Reference sound
dog	N/A	N/A
hat	word-final /t/	reference sound
socks	word-initial and word-final /s/	reference sound
ten	word-initial /t/	reference sound
thirty	word-initial /θ/	target sound
bath	word-final /θ/	target sound
mouth/teeth	word-final /θ/	target sound
ship	word-initial /ʃ/	target sound
shoes	word-initial /ʃ/	target sound
fish	word-final /ʃ/	target sound
chicken	word-initial /tʃ/	target sound
cheese	word-initial /tʃ/	target sound
sandwich	word-final /tʃ/	target sound

4.4.3 Transcription prompt task

A transcription prompt task was used in the current study to test the test participants' knowledge of transcription symbols. Transcriptions of real English words were not used, to ensure that children were not guessing the target symbols based on the surrounding symbols, many of which resemble the corresponding graphemes. Tergujeff's (2013, 87–88) subjects, for example, successfully produced the words <robot> and <anyone> with the cues /ˈroʊˌbɑt/ and /ˈɛniˌwʌn/. The productions were based on the IPA script for American English pronunciation, but there is no way to know whether the children were indeed familiar with the symbols. They might simply have equated them with graphemes and read them as if they were rendered into Finnish orthographical conventions, i.e. <roubot> and <eniwan>.

Using nonwords was deemed a more appropriate way to test the knowledge of symbols here. Nonwords are commonly used in phonological studies (Core 2012, 86), albeit mostly in nonword repetition tasks. Munson, Edwards, and Backman (2005) used a nonword repetition

task to study linguistic development in children with phonological disorders. In the Finnish context, nonwords have been used to study vowel qualities in adults (Peltola et al. 2015) and children (Immonen et al. 2023).

A total of 12 target nonwords and one example nonword were included in the transcription prompt task. The symbols used in the non-words are ones used in the *Come with me!* series. They appear to be based on the IPA script for British English, with some slight modifications. There were four nonwords per each sound of interest, two with a word-initial sound of interest and two with a word-final position for the sound. The nonwords were constructed so as to follow the phonotactic rules of English and with a simple consonant-vowel-consonant structure. Sounds other than the target sounds were chosen with the criteria that their transcription symbols must bear as close a resemblance to the orthographic counterparts as possible. This was done in order to ensure that the production of the nonwords was not unnecessarily hindered by non-target sounds.

The nonwords used in the test are presented in table 2.

Table 2. Nonwords used in the transcription prompt task.

Nonword	Sound of interest
/læt/	N/A
/θʌs/	word-initial /θ/
/θu:n/	word-initial /θ/
/muθ/	word-final /θ/
/dɔ:θ/	word-final /θ//
/ʃep/	word-initial /ʃ/
/ʃi:l/	word-initial /ʃ/
/kɪʃ/	word-final /ʃ/
/heʃ/	word-final /ʃ/
/tʃep/	word-initial /tʃ/
/tʃi:l/	word-initial /tʃ/
/ketʃ/	word-final /tʃ/
/si:tʃ/	word-final /tʃ/

The test procedure will be presented next, before moving on to the remaining two parts of the study, the exercise book observations and the teacher questionnaire.

4.4.4 Procedure and recording

The picture and transcription prompts were presented via a PowerPoint slide show. Four different versions of the slide show were made. These had differing orders of tasks as well as items within the tasks. This was done for the purposes of counterbalancing and to avoid a training effect. Yavas and Barlow (2006, 185) similarly altered the order of items to avoid a training effect.

The picture prompt task always started with the example word, a picture of a dog. The transcription prompt task started with a slide showing the English word <cat>, the Finnish word <kissa>, and the transcribed word /kæt/, on a blue background, following the conventions of the *Come with me*! series. This slide was followed by the example nonword /læt/. After the example word slides, the target words were presented in different orders.

Before data collection began in earnest, pilot data collection sessions were run, as is customary (Dörnyei 2007, 75). Three class four students using the *Come with me*! series took part in the pilot. The recording equipment, instructions, and prompts were tested in the pilot. Following the pilot, alterations were made to the instructions given to the test participants, and one picture was changed to a less ambiguous one.

Data collection was carried out in schools, during the students' school days, in an empty classroom or other suitable space. The participants were shown one of the four versions of the elicitation slides and given instructions for each part separately. They were given the prompt to name the picture or read out the nonword in the transcription, guess or partly produce the word, or skip if they did not want to or could not produce anything for said picture or word.

The productions were recorded with a laptop computer with a Vocaltone ProMix USB microphone. The microphone had a cardioid directional pattern, a frequency response of 18–20,000 Hz, a 24-bit resolution, and a 96 kHz sample rate. These meet and exceed the equipment requirements laid out in Butcher (2013, 64–65). An external soundcard is recommended for these types of studies (ibid.), but one was not available for the current study. The software used for recording was the most up-to-date version 3.7.3. of Audacity. Recording sessions always started with a check of the sound system, as is recommended (Core 2012, 87). The output was recorded to a digital file, in uncompressed wave format as suggested by Butcher (2013, 64–65) and Core (2012, 87).

4.4.5 Exercise book observations

In addition to the elicitation tasks detailed above, the student's English exercise books were examined. This was done to provide information regarding research question 2, "To what extent are transcription symbols used in teaching English pronunciation?". The underlying assumption was that if a student has worked on transcription-based exercises, these have been present in teaching and classroom activities. It should be noted that some children may also have completed exercises independently, without direction from the teacher.

At the beginning of the recording session with each child, four exercises including phonemic script were checked. The correctness of these exercises was not evaluated, merely whether the student had worked on the exercise. Each exercise was graded on a scale of 1 to 5, from totally incomplete to totally complete. The findings were logged onto an anonymised Excel file, with participant number as an identifier.

4.4.6 Teacher questionnaire

Survey answers were also collected from teachers responsible for teaching English to the children taking part in the study. The aim of the teacher questionnaire was to collect answers related to research questions 2 and 3. The questions mapped out the portion of sounds exercises used, as well as whether other transcription teaching materials had been used. The first question had five-point Likert scale tick box answer options, and the second binary yes/no tick boxes. There were also open questions regarding the additional materials used and reasons for using or not using sounds exercises. All ten teachers answered the questionnaire. The answers were migrated onto an excel file afterwards.

4.4.7 Ethics and data handling

As the current study dealt with human participants under the age of 18, utmost care was taken to follow the ethical principles for research with human participants, published by the Finnish National Board on Research Integrity TENK (2019).

Seeing that the study took place in schools, official research permits were also needed. Acquiring research permits was a challenging endeavour. Contact was made to municipal education committees or equivalent local governmental bodies, and research permits applied for through varying processes. Research permits were obtained from four municipalities.

Informed consent was ensured by providing the parents or carers of potential test participants a detailed information sheet, informing them of their right to participate or not to participate, as well as to discontinue at any time (Finnish National Board on Research Integrity TENK 2019, 9). Information was also given regarding the content and aim of the research, and the practicalities of the research protocol, as well as any potential harm and risks (Finnish National Board on Research Integrity TENK 2019, 10).

Ethical principles for research involving minors (Finnish National Board on Research Integrity TENK 2019, 11) were also followed. As the participants were minors under the age of 15, the consent for participation was given by parents or carers. The autonomy of minors was respected, and the principle of voluntary participation followed: on the day of the testing additional verbal consent was obtained from each participant. Some children decided to opt out at this point.

An ethical review was not needed, as consent was obtained from a parent or carer, and none of the conditions laid out by Finnish National Board on Research Integrity TENK (2019, 23) for requiring an ethical review were met. There was no need for an ethical review regarding the teacher survey, either.

The processing of personal data was handled following the Finnish National Board on Research Integrity TENK (2019) guidelines, as well as the EU Regulation 2016/679 articles 12, 13, and 14 related to personal data and the rights of the data subjects (European Union, 2016). The participant pool was provided with a Privacy Notice for Research Study, written in Finnish. This was a detailed document, laying out information related to the data controller, the people responsible for the study, the purpose of the study, and processing of personal data. The lifespan for processing and preserving the research data was also specified (Finnish National Board on Research Integrity TENK 2019, 10).

Personal data handled during the course of the study included speech recordings and answers given to the background questionnaire. The material was pseudonymised: participants were referred to using only a participant number. The recordings were saved in a password protected University of Turku Seafile drive, specified only with participant number. Only the data handler has access to the participant number key, which is kept separate from the collected data and will be destroyed by the end of the year 2026.

No personal data was collected from teacher participants, and their answers were anonymous. They received a research information sheet similar to that delivered to the student participant pool, and their participation was voluntary.

4.5 Acoustic analysis and scoring

4.5.1 Relational analysis

The analysis carried out in the present study in relation to the elicitation tasks was twofold. In both tasks, productions were compared to an intended target, but the target itself was different in the two parts. The productions in the picture naming task were compared to general acoustic criteria of the target sounds, and in this respect the analysis could be seen as conventional relational analysis (Core 2012, 90).

In the transcription prompt task, the analysis was likewise relational, but the intended target was not based on external criteria. In this task, the intended target was based on individual target sound productions in the picture-naming task, and as such different for each participant. As part of the research question stood “How proficient are students in recognising transcription symbols presented in their exercise book” the scoring needed to be based on the children’s knowledge of the symbols, regardless of their ability to produce the corresponding sounds. An intrapersonal relational analysis was devised to measure the knowledge of symbols separately from pronunciation accuracy. Each test participants’ productions in the transcription prompt task were compared to productions of the same consonants in the picture naming task. The picture-naming task also included reference sounds which were expected to be found in some productions instead of the target sounds. Thus, there were intrapersonal reference points available also for non-target sounds.

4.5.2 Praat analysis

Recordings of the elicitation tasks were high quality digital audio files which were both listened to and examined in *spectrogram* forms, i.e. visual representations of sound frequencies and intensities. Core (2012, 87–88) notes that acoustic analysis helps improve accuracy in determining the “finer details of sound production”. The acoustic analysis was carried out in version 6.4.27 of Praat (Boersma & Weenink 2025). The frequency scale was extended to 10 000 Hz, as is appropriate for studying fricatives (Ladefoged and Johnson 2015, 211).

The acoustic analysis included visually assessing the spectrograms of each individual word or nonword production, whilst simultaneously listening to the corresponding audio. The material comprised a total of 1632 items, 816 productions from the picture prompt task, and 816 productions from the transcription prompt task. These numbers also include erroneous words and "skips". The spectrograms enabled an assessment of frequency, amplitude, and time. In practice this was done by interpreting the concentration of energy at certain frequencies represented by varying shades of grey (Reetz and Jongman 2009, 156 and Ladefoged and Johnson 2015, 204).

The next sections will include a brief overview of the acoustic properties of the target and non-target sounds and comments on the scoring protocol.

4.5.3 Target sounds

The target sounds were fricatives and an affricate, which has a fricative component. Fricatives are characterised acoustically by an aperiodic noise component (Watt 2013, 92), i.e. local air turbulence caused by a constriction in the vocal tract (Cruttenden 2014, 192). The analysis concentrated on the spectral shape of the fricative, which in practice meant assessing the position and intensity of the noise component (Cruttenden 2014, 195). As all the target sounds were voiceless, no low-frequency energy depicting vocal fold vibration was expected (Reetz and Jongman 2009, 192). Expected non-target sounds included the stop /t/ and the sibilant /s/, whose acoustic characteristics are described below, along with the target sounds.

The target sound /ʃ/ is a sibilant identified by a relatively high intensity of the friction noise, a darker visualisation than the interdental fricative /θ/ (Reetz and Jongman 2009, 192 and Ladefoged and Johnson 2015, 211). The highest energy concentration was expected between 1700Hz and 4500Hz, and a lack of energy below 1200 Hz (Olive, Greenwood, and Coleman 1993, 93). A "mid-frequency spectral peak" was expected around 2500-3500 Hz (Reetz and Jongman 2009, 191) and the energy was expected to extend lower than it does in /s/ (Ladefoged and Johnson 2015, 211).

The non-target sound /s/ was in turn identified by a noise component similar to that of /ʃ/ but with more energy concentration at high frequencies. The spectrum of /s/ generally exhibits energy concentration between approximately 4200 and 6000 Hz, with random noise extending above 8000 Hz (Reetz and Jongman 2009, 191 and Ladefoged and Johnson 2015, 211).

The target sound /θ/ has a noise component like the sibilants do but of a relatively low intensity (Cruttenden 2014, 195). The spectrum was expected to be rather flat, with an even distribution of energy above 1200 Hz and none below 1200 Hz (Reetz and Jongman 2009, 191 and Olive, Greenwood, and Coleman 1993, 93).

The non-target sound /t/ is a plosive and was as such readily distinguishable from the target fricatives. A period of silence is visible in the spectrum during the closure phase of a voiceless stop (Cruttenden 2014, 167) followed by a spike pointing towards the quick onset of noise (Ladefoged and Johnson 2015, 209).

The final target sound /tʃ/ is a voiceless affricate. Its acoustic features are those of stops and fricatives (Cruttenden 2014, 189). For this sound, a period of silence similar to that of a plosive was expected, combined with a friction noise at the release. The friction component had to match the characteristics of /ʃ/ detailed above, so as to not be interpreted as a /ts/ sequence.

Vowels were not expected as non-target sounds, but the likeness of /θ/ to the grapheme <o> resulted in an abundance of vowel productions. These were easily distinguishable from the target sounds by the presence of a voice bar and clearly visible formants (Cruttenden 2014, 21).

4.5.4 Scoring

The picture prompt task was scored on a scale of 0 to 2, with 0 being totally incorrect, 1 partly correct and 2 completely correct. As Core (2012, 91) mentions, a problem with elicited tasks is that a child may not produce the intended word. Missing data can be a dilemma for scoring (ibid.). Core (2012 91–92) has scored nonresponses as 0 but does remark that nonresponsiveness is wholly different from an incorrect response. As the aim of the test here was not to test vocabulary knowledge, nonresponses and productions of non-target words were marked N/A, not zero. All N/As, 178 in total, were omitted in the analysis phase. These included cases of children not knowing a word or producing an alternative lexical item.

The score 0 was given to sounds which were deemed totally incorrect. These included for example the substitution of /θ/ with a stop or a sibilant and the omission of the stop element from the affricate, resulting in a /ʃ/ instead of a /tʃ/.

The score 1 was given to sounds which bore resemblance to the target sound but were not totally correct. This category included for example substitutions of /ʃ/ with /s/ and /tʃ/ with /ts/. The former was considered close, as both are voiceless sibilants, and the latter as it includes a stop-sibilant sequence.

The score 2 was given to sounds which met the criteria specified above for each target sound. Incorrect, but close words with the correct sound were also scored correct. An example of this was the production /θriːti/ for the prompt "30".

The transcription prompt task was similarly scored on a scale of 0 to 2. Unlike in the picture task, here nonresponses were scored as incorrect responses. The assumption was that if a child did not respond, they did not know the symbol in question. Both nonresponses and totally incorrect responses thus received a zero. Totally incorrect productions included for example producing a vowel instead of /θ/, a /f/ or /j/ instead of /ʃ/ and the sequence /tf/ for /tʃ/.

The score 1 was given to close sounds, as in the picture-based task. Here the productions were compared to productions of the same target sound in the picture prompt test. This score was given for example in cases where the child produced a /ts/ for /tʃ/ but had produced /tʃ/ correctly in the picture task. The sequence /ts/ was also given one point when there were no productions of /tʃ/ available for said child in the picture task.

The score 2 was given to correct sounds, which in this case meant an identical or near-identical production as compared to the same sound in the picture task. This included cases where /ts/ was produced instead of /tʃ/ both in the picture and the transcription task, e.g. a child saying /tsiken/ for the picture of a chicken and /tsep/ when the prompt was /tʃep/. There were also cases where the child substituted /s/ for /ʃ/ in both prompt type tasks. This scoring choice stemmed from the aim to ensure this part of the test measured the participants' knowledge of the symbols, not their ability to produce the target sounds. The score 2 was naturally also given to children who produced a target sound according to acoustic criteria in both the picture and the transcription prompt task.

4.6 Statistical methods in data analysis

The current study used mixed methods, i.e. both quantitative and qualitative methods of analysis. Qualitative analysis was done through both summary statistics and inferential statistics, with an appropriate method selected for each set of data.

Calculations were done with Microsoft Excel 2025 and R Statistical Software version 4.4.2 (R Core Team 2024). Tables were produced with Microsoft Excel 2025, and plots and graphs with R Statistical Software version 4.4.2 (ibid.).

Results of the elicitation tasks were analysed with summary statistics, including measures of central tendency and measures of variability. The pronunciation score variable is a categorical variable, a variable type where the range of possible values is often very limited (Larson-Hall 2016, 52). Here there were three possible levels, which did not carry any inherent numerical value. Considering the level and scope of the current study, statistical testing was deemed unsuitable for these data, and a descriptive approach was selected as a more suitable method.

The exercise completion portion was analysed as follows. Traditional descriptive figures (mean, median and standard deviation) were calculated. Additionally, a linear mixed effects model was used to evaluate the effects of exercise number and teacher on the completion rate of transcription-based exercises in the students' exercise books. In this model the completion rate was the response variable, and exercise number and teacher the explanatory variables. Exercise number was a fixed effect, as it had "factor levels that exhaust the possibilities", i.e. the written transcription-based exercises in the book (Larson-Hall 2016, 58). Conversely, teacher number was a random effect, as it does not exhaust all the possibilities but represents "individual experimental units" (ibid.). The CI was set to 0.95, giving a 95 per cent confidence interval (Winter 2020, 163). R^2 values for the model were then calculated, generating the marginal R^2 and the conditional R^2 values (Winter 2020, 234). Model comparison was done with Anova (Winter 2020, 185), through a Type II Wald chisquare test. This resulted in an Analysis of deviance table, as a random variable was used.

The results of the teacher survey were analysed through absolute numbers, as the sample size was a mere 10 participants and thus not truly suitable for summary statistics. The answers to open questions were dealt with qualitatively.

5 Results

Results of each of the three sections are presented below, with the elicitation task first followed by the exercise book observations and the teacher questionnaire.

5.1 Elicitation tasks

Productions in the elicitation task were graded on a scale of 0 to 2, with whole numbers only, as detailed above in section 5.5.4. The mean, the median, and the standard deviation of scores for each item are presented in table 3.

Table 3. Scores of picture prompt task, all target words (n=68).

	fish	**ship**	**shoes**	**sandwich**	**cheese**	**chicken**	**bath**	**mouth/teeth**	**thirty**
mean	1.90	1.97	1.90	1.75	1.85	1.96	0.97	0.74	0.47
median	2	2	2	2	2	2	0.5	0	0
SD	0.24	0.26	0.37	0.6	0.45	0.19	1	0.95	0.86

The scores for the picture prompt task varied between 0 and 2, with overall higher scores for the sibilant /ʃ/ and the affricate /tʃ/ than for the fricative /θ/. The means for the /ʃ/ sounds in *fish*, *ship*, and *shoes* were 1.90, 1.97, and 1.90 respectively. The median for all three was 2. Standard deviations were between 0.24 and 0.37. The affricate /tʃ/ in the words *sandwich*, *cheese*, and *chicken* similarly had high means. *Sandwich* reached a mean score of 1.75, *cheese* of 1.85, and *chicken* of 1.96. The median, here too, was 2 for each item. The standard deviations ranged from 0.19 to 0.6. The scores for the interdental fricative /θ/ were notably lower: *bath* reached an average of 0.97, *mouth/teeth* 0.74, and *thirty* merely 0.47. The median for *bath* was 0.5, and 0 for *mouth/teeth* and *thirty*. The standard deviations for the /θ/ sound were between 0.86 and 1. The sounds /ʃ/ and /tʃ/ were thus pronounced with high accuracy and smaller standard deviation, whereas /θ/ was pronounced with low accuracy and higher standard deviation. The sounds /ʃ/ and /tʃ/ were pronounced with such high accuracy that there were few replacement sounds. The sound /θ/, on the other hand, was commonly replaced with sounds /t/ and /tʰ/.

The transcription prompt task was scored likewise with 0, 1, and 2, and the results were low overall, with the median for all 12 items at zero. The results for the sound /ʃ/ can be seen in table 4.

Table 4. Scores of transcription prompt task, nonwords with /ʃ/ (n=68).

	/kɪʃ/	**/heʃ/**	**/ʃep/**	**/ʃi:l/**
mean	0.35	0.26	0.47	0.29
median	0	0	0	0
SD	0.59	0.48	0.66	0.52

The means for the sibilant /ʃ/ in the transcribed nonwords were 0.35 for /kɪʃ/, 0.26 for /heʃ/, 0.47 for /ʃep/, and 0.29 for /ʃi:l/. The standard deviation ranged from 0.48 to 0.66. The symbol /ʃ/ was produced as /f/, /j/, and /l/ sounds, receiving 0 points, and as /s/, receiving 1 or 2 depending on the intrapersonal relational analysis. There were also ample nonproductions.

The means for the affricate /tʃ/ were a 0.46 for /ketʃ/, 0.24 for /si:tʃ/, 0.40 for /tʃep/, and 0.40 for /tʃi:l/. The standard deviations were all between 0.52 and 0.68. For the sound /tʃ/, renditions included for example the cluster /ts/, /tf/, and /tj/. Nonproductions were also common. Table 5 shows the results for /tʃ/.

Table 5. Scores of transcription prompt task, nonwords with /tʃ/ (n=68).

	/ketʃ/	**/si:tʃ/**	**/tʃep/**	**/tʃi:l/**
mean	0.46	0.24	0.40	0.40
median	0	0	0	0
SD	0.68	0.52	0.67	0.68

The fricative /θ/ received lower scores than the other sounds in the transcription prompt task, similarly to the picture prompt task. The figures can be seen in table 6.

Table 6. Transcription prompt task, nonwords with /θ/ (n=68).

	/dɔ:θ/	**/muθ/**	**/θʌs/**	**/θu:n/**
mean	0.00	0.04	0.00	0.01
median	0	0	0	0
SD	0	0.27	0	0.12

Only one participant produced the /θ/ sound correctly in this task type on one occasion, producing the sequence /maʊθ/ for /muθ/. Two participants scored one point for /θ/ words, producing partially correct sounds. The most common productions for /θ/ were vowels akin to the Finnish /o/. Nonproductions were also common. The means were zero, apart from 0.04 for

/muθ/, and 0.01 for /θu:n/. Standard deviation was low, between 0 and 0.27, as is expected based on the lack of variance explained above.

If we look at all productions of picture prompt and transcription prompt items together, collated by phoneme position, there are indications towards some patterns, as we could see above with individual items as well. Figure 1 presents a scatterplot with individual data points, i.e. each dot corresponds to one production by one participant. Jitter is added to avoid overlapping of dots. It should be noted that there were less observations of picture prompt type items, as N/As were omitted, and reference sound scores formed no part of the analysis.

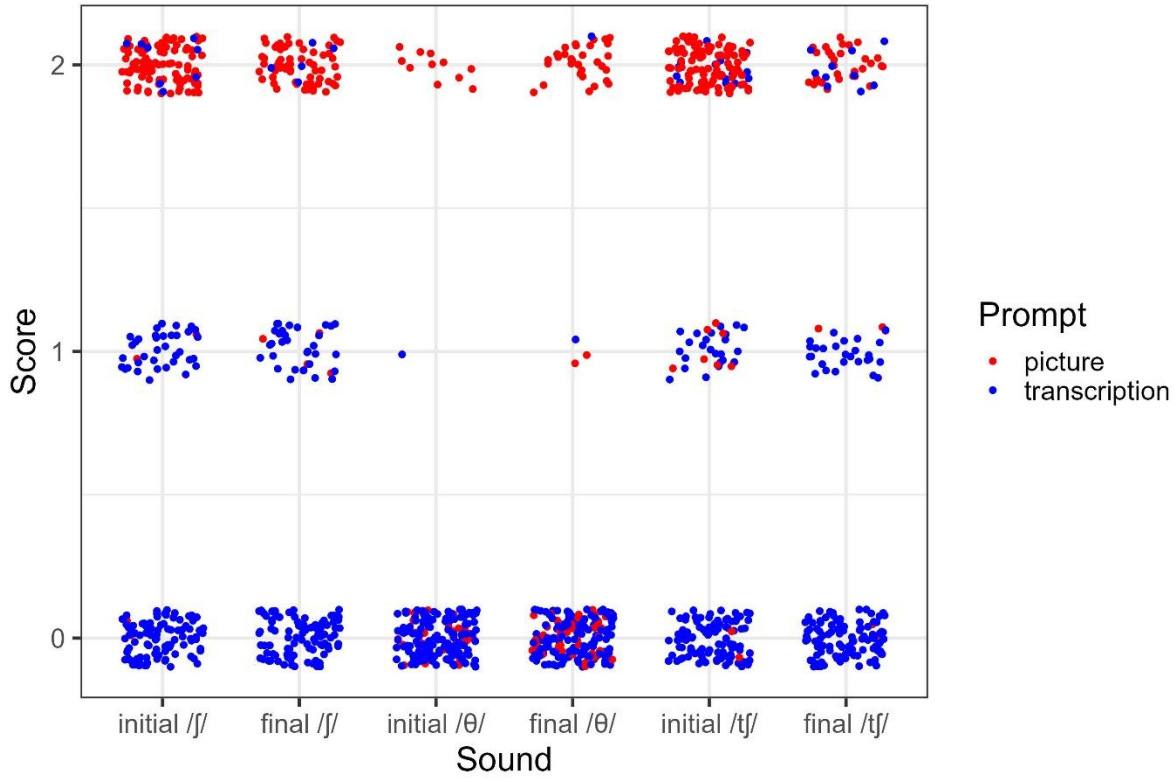

Figure 1. A scatter plot of individual data points for each phoneme position and prompt type.

Firstly, scores in the transcription prompt task were generally noticeably lower than those in the picture prompt task. In terms of sounds we can see how the sound /θ/ and its symbol were both more challenging for test participants than the other two target sounds and symbols. Recognising the symbol /θ/ was more difficult still than producing the sound itself, with all but three data points for the transcription prompt task sitting firmly at zero.

The plot depicts word initial and word final sounds separately. There does not seem to be apparent differences in these within sounds or between sounds, indicating that phoneme

position was not a notable factor in these results. There are more red data points (picture prompt) for initial /ʃ/, final /θ/ and initial /tʃ/. This is explained by there being two picture prompt words for all of these phoneme positions, with only one each for the opposite positions for each sound.

The results presented above indicate that students are not very proficient in recognising transcription symbols, but this is not reflected in their proficiency in producing the corresponding sounds. It can also be seen that both the symbol and the sound /θ/ appear more challenging than the other two target sounds in the current study.

5.2 Exercise book observations

Exercise book observations were made regarding four transcription-based exercises in different parts of the student participants' exercise book. The exercises are referred to here as exercises 1, 2, 3, and 4, corresponding to their order in the book. The completeness of the exercises was scored on a scale of 1 to 5, with 1 being totally incomplete and 5 totally complete. The means of exercise completion were 3.9, 2.8, 2.4, and 2.0, from the first exercise to the last. For exercise 1 the median was 5, for all others 1. The standard deviation for all fell between 1.7 and 2.0. There was thus notable variation between the completeness of exercises.

Table 7. Exercise book observations (n=68).

	Exercise 1 (p.28)	**Exercise 2 (p.34)**	**Exercise 3 (p.62)**	**Exercise 4 (p.120)**
mean	3.9	2.8	2.4	2
median	5	1	1	1
SD	1.8	2	1.9	1.7

A linear mixed effects model was fitted to the data, to see how the completion rate was affected by the position of the exercise in the book (fixed effect) and the teacher (random effect). The lowering median of completion scores as the year progresses and the rather high standard deviation pointed in the direction that there might be a notable effect. Based on this model the standard deviation for teachers was 1.207, that is, on average the deviation from the mean was 1.207 per teacher.

The conditional R squared was 0.509, i.e. 50.9 per cent of variation in the completion level can be explained by the effects of exercise number and teacher. The marginal R squared was

0.126, i.e. 12.6 per cent of variation can be explained by exercise number alone. The effect of teacher was thus 0.383, i.e. 38.3 per cent. A type II Wald chi-square test (Anova) showed that the effect the exercise number had on the completion rate, with teacher effect noted had a p-value of 2.2e-16, i.e. the effect was statistically extremely significant.

Figure 2 shows the estimates and error bars, i.e. the 95 per cent confidence intervals of the mixed effects model. Here we can see how the exercise completion rate steadily falls as the school year progresses.

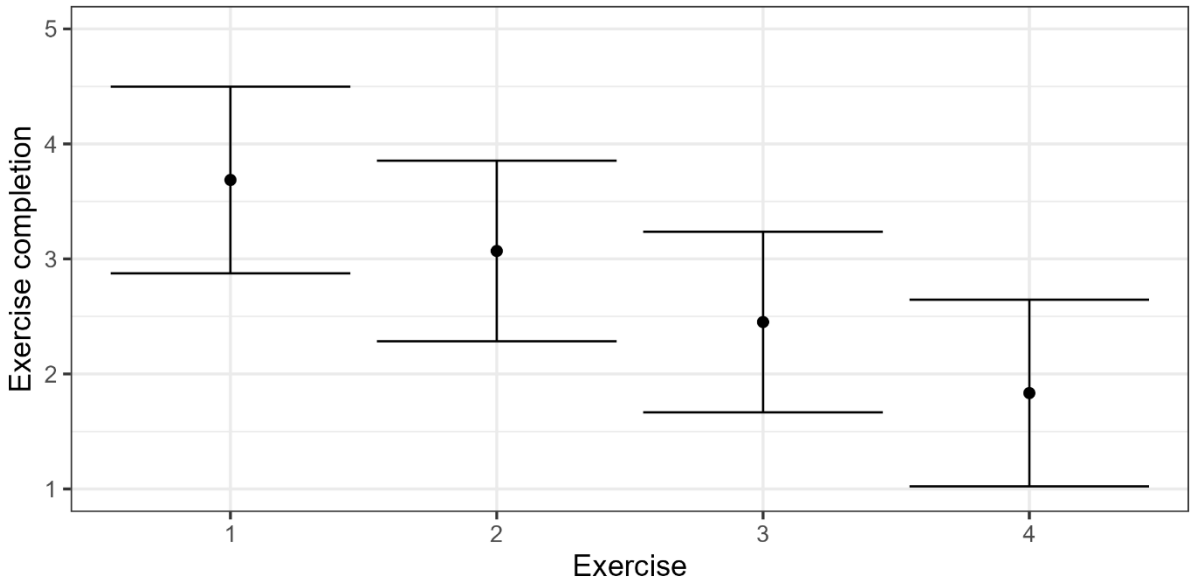

Figure 1. Estimates and error bars for exercise completion.

5.3 Teacher questionnaire

The teacher questionnaire showed that the use of sounds exercises in fourth grade English lessons varies and overall usage rate is not very high, as was also indicated by the exercise completion analysis. No teacher stated that they do not use the sounds exercises at all. The most common answer was “I have used a few (less than 25%) of them”, with four teachers ticking this option. Two teachers had used “about half”, and three teachers “most” of the exercises. One teacher acknowledged that they had used all of the exercises.

The teachers were also asked whether they have used transcription or IPA materials outside of the book in their teaching. Three teachers answered in the affirmative, and seven stated they had not. The vast majority thus had not used additional transcription materials. The materials

that had been used were “Teacher's manual, examples from words practiced” and “Handouts, A-B-slips”.

The answers to these questions are presented in Figures 3 and 4.

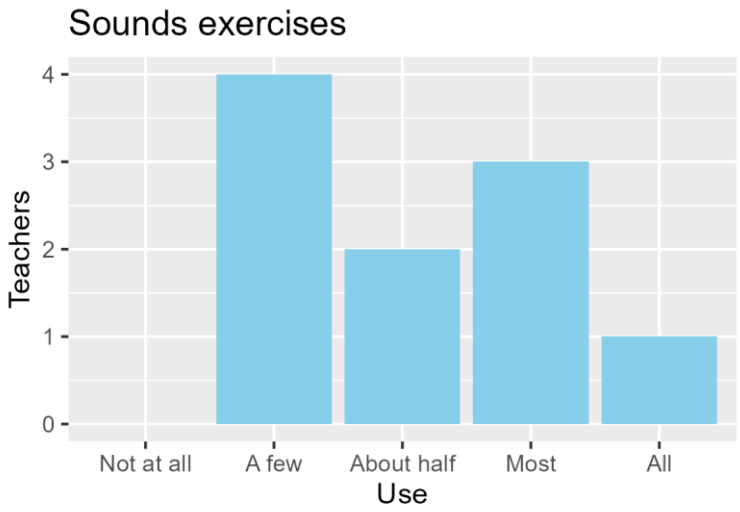

Figure 2. Sounds exercise use.

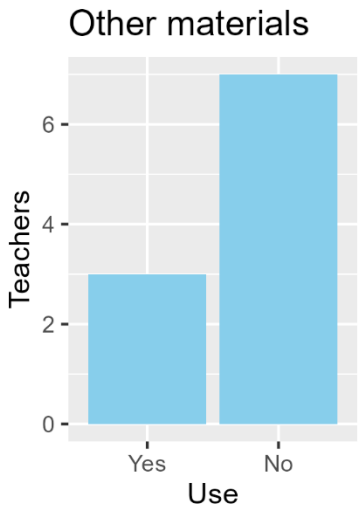

Figure 3. Other material use.

The final research question in the current study was related to the reasons behind teachers opting to use or not to use transcription symbols in their teaching. The answers were divided into reasons for using and reasons for not using transcription. Reasons for not using transcription included lack of time (5 teachers), prioritisation of other material (3 teachers), and transcription being unnecessary due to pronunciation being “easy for most” (1 teacher). One teacher noted that they had gone through the material systematically during the school year at first but had to “catch up” in the spring. This presumably refers to skipping transcription exercises, possibly among others, to save time. Transcription exercises were seen as something to be dropped, if necessary, also by respondents who cited prioritisation. One teacher said “[s]ometimes there's just not enough time to do everything in the book”, and another “we don't have time for extra things”. Transcription exercises were perceived as extra also by the teacher who stated “[t]he placement of exercises does matter, as they are in the Language corner. I see this as extra material”.

There were only three answers related to reasons for using transcription. These mentioned exercises being good and pupils liking them, the teacher considering transcription important, and needing additional examples. One teacher recounted having personally benefited from the

sounds exercises, stating that differences in pronunciation had not been “too clear” to them before using this book series.

The results will be discussed next. The findings will be compared to previous research and possible explanations for the findings considered. Practical implications will also be discussed.

6 Discussion

The results of the current study were for the most part in line with findings of previous research, providing an updated glimpse into the situation in terms of transcription use in primary school teaching in the 2020's. Novel data were obtained regarding knowledge of transcription symbols among primary school aged children.

6.1 Elicitation tasks

The picture prompt task indicated that students produce the sounds /ʃ/ and /tʃ/ with rather high accuracy compared to the sound /θ/. The sound /ʃ/ can be expected to be more familiar to Finns, as it is used in some loan words (Hakulinen et al. 2004, 40) and as a common "hushing" sound from early childhood onwards. It could be that positive transfer was a factor here. As Vivian Cook (2003, 11) notes, similarities in L1 and L2 sound systems can have a positive effect on learning. The ease of /ʃ/ is likewise somewhat in line with Flege's (1995) SLM: out of the three sounds studied here /ʃ/ was produced with the highest accuracy and it is also the sound which is the least unfamiliar to Finnish speakers. This finding is also in line with Lintunen (2004, 216). The sibilant /ʃ/ was not among the most difficult sounds in his error analysis, either.

The interdental fricative /θ/, on the other hand, was the most difficult for the participants of this study. This result is not surprising when studied from a contrastive point of view, nor as compared to findings of previous studies. Flege (1995) suggests that completely new L2 sounds, as compared to one's L1, are the most difficult for language learners, especially early on in the language learning process and in production. The test subjects here could all be seen to be in early years of their language learning and as this was a production task, difficulties were to be expected. Difficulties in the production of this sound have also been noted by previous research. It was revealed to be among the most difficult for Finns by Lintunen (2004, 216), and Morris-Wilson (2004, 61).

The most common replacement sounds for /θ/ were /t/ with and without aspiration. Several cross linguistic factors could have contributed to this. Replacing the sound portrayed by the digraph <th> with the sound /t/, whose orthographic counterpart is identical to the first half of the digraph, could be seen as stemming from orthographical interference (Tergujeff et al. 2017, 110 and Celce-Murcia et al. [2010] 2017, and Ullakonoja and Dufva 2017, 29). The results could also have been affected by phonological transfer. Lado's ([1957] 1971, 11)

concept of the strength of the native sound system could suggest that the participants here were, at least in the cast of the unaspirated /t/ replacement, transferring native phonemes into the L2. Even with the differing manners of articulation there is a clear connection with the sounds /θ/ and the Finnish sound /t/, as both are dental sounds. This could be one possible reason for opting for this replacement sound in the case of Finnish learners of English.

The affricate /tʃ/ being relatively easy, as compared to /θ/, was somewhat surprising. This sound has been shown to be among the most difficult for Finns (Lintunen 2004, 216 and Morris-Wilson 2004, 102). In this data, the words *sandwich*, *cheese*, and *chicken* were all produced with high accuracy. *Sandwich* resulted in many nonproductions, though, and can be thus understood as a difficult lexical item for this age group. *Cheese* is a well-known lexical item and *chicken* likewise. Incidentally, the word *chicken* had great prominence during the spring of the testing, with *A Minecraft Movie* having been launched shortly before the data collection began. The movie was a box-office hit in its first weeks, and its hit song "Steve's Lava Chicken" reached viral singles lists and had millions of YouTube views (Suomen elokuvasäätiö 2025 and Offbeat Ventures, LLC 2025). The song features the exclamation "ch-ch-ch-chicken", which became a kids' catchphrase in the spring 2025 and perhaps served as excellent affricate practice. This might be reflected in the relative ease of /tʃ/ here. *Chicken* reached a mean of 1.96 out of 2 in the picture prompt task, highest of the the /tʃ/ words and second highest overall.

In addition to the contradiction between these findings and those of Lintunen and Morris-Wilson mentioned above, the relative ease of /tʃ/ is also intriguing when examined from a contrastive point of view. The affricate does not appear in the native Finnish sound system but has marginal occurrence in some loan words such as the name of the spicy pepper /tʃili/, <chili>. If /tʃ/ is considered a new sound to Finns, negative transfer would be expected here, as suggested by Lado ([1957] 1971, 11). The sound being completely new to Finns would also result in it being difficult to produce for new learners of the language, following Flege's (1995) rationale. But unlike the evidently new sound /θ/ the affricate /tʃ/ was produced with notably high accuracy. If /tʃ/ is considered more of a familiar sound, as was done with the analysis of /ʃ/ above, the findings here do fall in line with Flege's (ibid.) model.

The scores in the transcription prompt test were very low overall, with all means between 0 and 0.5 out of 2. Somewhat low scores were to be expected, based on what was known about transcription use in teaching, but the utter foreignness of the symbols to most children was

striking. Entirely correct (score 2) productions for any of the sounds of interest were immensely rare, and nonproductions frequent. As Lintunen (2004) and Tergujeff (2012b) both found, transcription has not been used much as a teaching method in Finnish schools. It is therefore not surprising that children do not know the symbols. Children routinely answered with "I don't know" or "skip" or attempted to guess the correct sound based on the shape of the symbol. This led to /θ/ being regarded as an <o>, for example, and /ʃ/ as an <s>, or the ascender <f>, or the descender <j>. This strategy seems natural for Finnish children, as they are used to a high symbol to sound correspondence and as such perhaps prone to realising the transcription symbols as if they were familiar alphabetical items. The nonword /θʌs/, for example, was frequently produced as a very Finnish sounding /oɑs/. This finding is in line with the ideas of Tergujeff et al. (2017, 110) and Celce-Murcia et al. ([2010] 2017, 419), who note that interference from the native writing system is possible in students who are accustomed to a strong phoneme-grapheme correspondence.

The participants of the study had been using books featuring transcription symbols for two school years, yet many children still appeared scarcely to have encountered transcription symbols before. Many nervously asserted "I'm not very good at these", "that's a weird symbol", or "that's a strange letter". As the core curriculum for primary education explicitly states transcription symbols should be practiced, and books do include these, it is curious how limited children's knowledge of transcription symbols was.

It is possible, that the results of the elicitation tasks may be attributed to one or more learner external or learner internal factors. The learning environment, especially, is a learner external factor which is closely connected with the learning process. Here the learning environment would have primarily been the language classroom, though informal learning will surely have taken place in addition. The realities of classroom instruction, such as needs of different learners and group sizes, for example, undoubtedly have an effect on the teaching and learning of pronunciation and transcription symbols. Apart from the effect of the teacher, which is discussed below, other learner external factors fell out of the scope of this study.

Learner internal factors, such as aptitude and motivation, may have also been factors in this study. Due to this limitation, we cannot ascertain whether the results were affected by low aptitude or motivation, or both. Motivation could also have been affected by the factor that the test was carried out by an adult not affiliated with the school and that the results did not affect the participants' English grade. Aptitude and motivation could be taken into closer

consideration in future studies, to further broaden the understanding of factors affecting attainment and performance in pronunciation related tasks.

Based on the results and discussion above, research question 1 can be answered as follows: students are not at all proficient in recognising the tested transcription symbols. They are, however, rather skilled at producing some of the sounds. The sound /θ/ and the corresponding symbol were the most difficult out of the three tested sounds and symbols.

6.2 Exercise book observations and teacher survey

The exercise book observations and the teacher survey were devised to complement one another. Teachers were asked what proportion of the sounds exercises they had used this year, and students' exercise books were checked to see what the completion rate was. Where the teacher questionnaire mainly yielded answers regarding the school year as an entirety, the exercise book observations also provided information on how the usage of transcription changes as the school year progresses. There was a pattern of decreasing use throughout the year, and this was confirmed with a linear mixed effects model. The effect of exercise number was notable and statistically extremely significant. This decrease could be explained by the "hurry" that was cited by many teachers as the reason for not using transcription in their teaching. These findings are similar to those presented by Jarosz (2023, n.p.). Her informants likewise cited hurry as a reason for omitting pronunciation related content from their curricula. The sense of hurry might be smaller early on in the year, explaining the higher completion rate of Exercise 1. The lowering completion rates might be attributed to having to "catch up" in the spring, which was explicitly mentioned by one teacher.

The completion rates differed between teacher greatly: the average deviation from the mean was 1.207 per teacher, and 38.3 per cent of variation in exercise completion could be explained by teacher. As we saw with teachers' answers in the EPTiES survey, teachers do not agree on questions related to transcription as a teaching method (Henderson et al. 2015, 272 and Tergujeff 2012a, 42). The results of the current study were similar: teachers offered contradicting views in open answers, and data from the five-point scale question were scattered. The teacher effect was thus a notable learner external factor affecting the completion of pronunciation exercises.

The teachers were also asked whether they have used transcription-based material "outside this book", referring to the *Come with me! 4* book. Seven out of ten had not, and of the three

who had some cited the teacher's manual as such material. As the teacher's manual is part of the *Come with me!* product family it cannot be wholly seen as being material "outside this book". A vast majority of participants here thus only used the book or affiliated materials. As 98 per cent of FL teachers often use textbooks in their teaching (Luukka et al. 2008, 94), this reliance on the textbook is not surprising. It should, however, be noted that Luukka et al.'s figures did not indicate teachers who *only* use textbooks, but teachers who *often* do. As the reliance on textbooks is so high, and the materials generally accepted as being of high quality, it might be that teachers are less likely to experiment with additional material. Perhaps additional teaching material related to teaching English sounds to Finnish learners would need to be made more readily available or teachers given additional training in creating their own customised materials.

One pivotal finding in this study was teachers considering transcription as something "extra". One teacher claimed they "don't have time for extra things". This is an intriguing view, as transcription is mentioned in curricula and included in the actual chapters of the exercise book. Considering transcription "extra", regardless, required a personal value judgement to be made. Another teacher noted "[t]he placement of exercises does matter, as they are in the Language corner. I see this as extra material." The sounds exercises are, in fact, not in the "language corner" but they share a page with it, at the end of each chapter. The language corner includes cross-linguistic practice, which is also explicitly mentioned in the core curriculum (Harjula et al. 2023 and Finnish National Board of Education 2016). The concept of transcription being considered something supplementary was noted by Tergujeff et al. (2017, 100), and Jarosz (2023, n.p.), similarly, mentioned other content being considered more important, suggesting that pronunciation content is not seen as crucial. This is something which might yield practical implications for publishers. If transcription exercises were scattered throughout chapters and the book and not presented separately at the end of the chapter, they might be more easily considered part of the central content.

A curious feature in the teachers' responses was that the difficulty of transcription symbols was never cited as a reason for not using them in teaching. This is an inconsistency as compared to previous research. Mompean (2015, 294) reported that transcription symbols are often perceived as difficult by teachers, but no such note was made by the informants in this study. It should be noted, however, that as the teacher sample was small and answers brief teachers did not most likely mention all their reasons in their responses.

The student participants of this study were younger than students in many other studies related to pronunciation instruction and use of transcription. As Henderson et al. (2015, 271) noted, teachers might be less likely to teach transcription to younger learners. This may have been a factor in the results of the current study. Further research would be needed to examine the proficiency of older EFL students in recognising transcription symbols and producing the corresponding sounds.

Based on the exercise book observations, the following answers can be offered for research questions 2 and 3. Firstly, transcription symbols are used in teaching English pronunciation but not to a uniformly significant extent. There is notable variation between teachers and thus teaching groups. The reasons behind teachers opting to use or not use transcription are likewise varied. Time pressure and perceived lack of importance were the most often cited reasons for skipping or skimming this content.

6.3 Strengths, limitations, reliability, and validity

Whilst this study has its strengths, there are also some limitations which should be addressed. Likewise, there are considerations of reliability and validity related to this study. These will be looked at next.

The variables examined in the current study were operationalised with care. The elicitation task was planned in such a way as to truly measure knowledge of transcription symbols. Use of sounds exercises, likewise, was measured through directly observing their completion rate, along with directly enquiring teachers about usage rates through the teacher survey. This could be seen to relate to the construct validity of the current study; in terms of the target sounds and symbols, the protocol measures rather explicitly what it sets out to measure, i.e. how well the symbols are recognised and corresponding sounds produced. Naturally, however, as all numerical scales related to skill or knowledge are inherently arbitrary, there cannot be absolute construct validity.

The content validity of the current study is lacking in terms of the representativeness of the measurement; whilst the sounds and symbols tested were selected with care following set criteria, they are by no means representative of all sounds and symbols EFL students are taught. Content validity could have been improved by studying a larger number of sounds and symbols.

Face validity of this study was improved by using picture elicitation and nonword-based tasks, both recognisable methods for assessing FL and phonological knowledge. The protocol being researcher-generated naturally mitigates the face validity, as using intrapersonal relational analysis combining picture elicitation with nonword production is a novel construct.

The research design in this study does not carry criterion-based validity. Standardised, norm-referenced phonology assessments would have provided this but were deemed unusable for answering the research questions.

The sample of this study has both strengths and limitations. The representativeness of the sample is rather high, as was detailed in section 4.3. The sample size is satisfactory, but a larger sample would have made the results more generalisable. The study could have been made stronger also by eliciting several productions of each item from each informant, as is customary in phonetic research.

The reliability of the study was affected by only having one researcher analyse the participant productions. Having external judges would have improved the reliability but was not feasible considering the scope of this study. Analysis was, however, meticulously carried out through both auditory analysis and examining the visual spectral forms of the participant productions.

Despite being limited to only one age group, users of one book series, and a limited number of phonemes, the clear patterns in the results do indicate that these findings may be typical for English learners in Finnish primary schools.

6.4 Future implications

The results of the current study imply that the transcription symbols featured in textbooks are currently perhaps not serving their purpose, and some changes in material or their use, or even a larger reform might be called for. Lintunen (2004) connected transcription skill with improved pronunciation indicating that the knowledge of transcription symbols may be beneficial in language acquisition, at least with older learners. The problem currently seems to lie with the lack of teaching and consequently in the knowledge of transcription symbols. Especially with primary school students, benefits of learning transcription are nigh on impossible to observe as long as transcription is scarcely taught. Peltola et al. (2015) did indicate that the mere presence of transcription may aid pronunciation and Tergujeff et al. (2017, 106) that transcription teaching does not have negative effects, but one might argue that this is not nearly sufficient justification for including transcription in primary school

curricula and teaching materials. It could be thus argued that one of two routes needs be taken: either transcription be truly made a part of EFL instruction and its effects duly evaluated or alternative methods for pronunciation instruction be examined.

As Finnish children are used to direct grapheme-phoneme correspondences and many English phonemes have a close counterpart in the Finnish sound system (and consequently the orthographical system), one might wonder if simply rendering English words into Finnish orthography, for example, could serve the purpose of guiding pronunciation in the correct direction more efficiently than transcription does. Perhaps a Finnish child would produce something closer to the target word *imagination* with the prompt <imädsineishön> than with /ɪmædʒɪneɪʃən/, for example. If diverging from the tradition of using transcription is not desired, it seems some changes are needed in the presentation and use of transcription symbols in teaching materials, as well as teacher training. At present, it appears the symbols are included in books and mentioned in curricula without legitimate consideration regarding their usefulness.

Further and more extensive research is needed to broaden the understanding regarding the use and usefulness of transcription symbols in Finnish EFL teaching. Studies mapping out alternative ways of conveying phonological information regarding English vocabulary items in textbooks might also be necessary. As electronic teaching materials are becoming increasingly popular also in lower years, options for harnessing technology for phonological training should be evaluated. The future of pronunciation instruction is full of possibilities, so long as practical implementations are tied to topical research findings, without shying away from innovative approaches.

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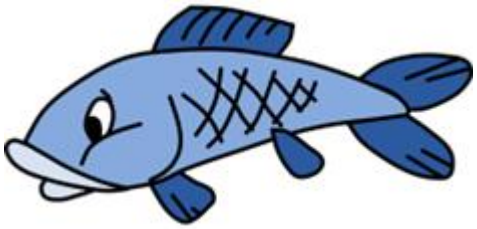
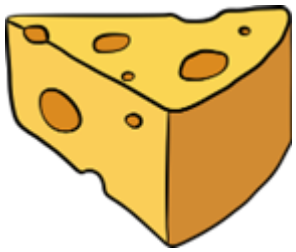
Appendices

Appendix 1 Elicitation pictures for target and reference sounds

Appendix 2 Finnish summary

Tämä pro gradu -tutkielma käsittelee foneettisten merkkien käyttöä alakoulun englannin opetuksessa. Foneettisilla merkeillä on pitkä historia suomalaisissa englanti vieraana kielenä -oppimateriaaleissa, mutta opetussuunnitelman perusteissa niiden käyttö mainittiin vasta vuonna 2014. Tutkielman tavoitteena oli kartoittaa, tunnistavatko alakoululaiset näitä merkkejä ja osaavatko he tuottaa niiden kuvaamia äänteitä. Tutkielma käsitteli myös sitä, minkä verran foneemista kirjoitusta käytetään alakoulun englannin ääntämisen opetuksessa ja mitä syitä opettajilla on käyttää tai olla käyttämättä sitä. Tämä tutkielma kuuluu vieraiden kielten oppimisen tutkimuksen alaan ja käsittelee kasvatustieteellisiä, kielitieteellisiä ja fonetiikkaan liittyviä teemoja.

Vieraan kielen ja eritoten vieraan kielen ääntämisen oppiminen on monitahoinen ilmiö, ja siihen liittyy sekä oppijan sisäisiä että ulkoisia tekijöitä. Ulkoisiin tekijöihin kuuluu muun muassa oppimisympäristö, kun taas sisäisiä tekijöitä ovat muun muassa motivaatio ja kielellinen lahjakkuus. Oppijan ikä ja ensikieli puolestaan ovat universaaleiksi miellettyjä tekijöitä, joilla on osoitettu olevan vaikutusta vieraan kielen oppimiseen. Ääntöelimistö rutinoituu ensikielen oppimisen jälkeen, joten erityisesti ääntämisen kannalta ikä saattaa olla merkittävä tekijä. Ensikielen tai -kielten on myös nähty vaikuttavan ääntämisen oppimiseen: ensin yhteys nähtiin pääosin negatiivisena ja yksisuuntaisena, mutta nykyään siirtovaikutuksen ajatellaan olevan monisuuntaista ja niin positiivista tai neutraalia kuin negatiivistakin. Kontrastiivisen näkemyksen mukaan oppijalle helpoimpia ovat äänteet, jotka ovat täysin samanlaisia ensikielen ja opittavan kielen välillä, kun taas samantyyliset ja täysin erilaiset äänteet aiheuttavat vaikeuksia. Tässä tutkittavat äänteet on valittu kontrastiivista näkemystä hyödyntäen.

Ääntämisen opettamisen tulisi olla niin opetussuunnitelman kuin asiantuntijoidenkin mukaan eksplisiittistä, mutta aina tämä tavoite ei toteudu. Suomessa on ollut nähtävissä epäjohdonmukaisuutta ääntämisen opetuksen tärkeyden tunnistamisen ja konkreettisten opetuskäytäntöjen välillä. Ääntämisen opetus mainitaan vuoden 2014 Perusopetuksen opetussuunnitelman perusteissa ja paikallisissa opetussuunnitelmissa. Opetussuunnitelmat painottavat suprasegmentaalista lähestymistapaa, mutta viittaavat myös äännetasoon mainitsemalla ”foneettisen tarkekirjoituksen” merkkien harjoittelun. Kun otetaan huomioon, että opetussuunnitelmat velvoittavat opettajia opettamaan ääntämistä ja jopa foneettisia merkkejä, olisi toivottavaa, että opettajilla olisi ammatilliset valmiudet toteuttaa opetusta

tavoitteiden mukaisesti. Sekä Suomessa että muualla Euroopassa vaikuttaa kuitenkin siltä, että opettajat eivät koe saaneensa riittäviä valmiuksia ääntämisen opettamiseen. Tähän viittaavat esimerkiksi *Pronunciation Teaching in Europe Survey* -tutkimus ja Elina Tergujeffin tutkimukset. Tutkimusten tulokset viittaavat myös siihen, että koulujen ja opettajien välillä voi olla eroavaisuuksia ääntämisen opetuksessa.

Opetussuunnitelman ja opettajien ohella ääntämisen opetukseen vaikuttavat myös oppikirjat. Suomessa opetussuunnitelman perusteisiin perustuvia oppikirjoja julkaisevat kaupalliset toimijat. Oppikirjoja käytetään pääasiallisena oppimateriaalina vieraan kielen oppitunneilla, joten oppikirjoilla voidaan nähdä olevan huomattava vaikutus opetuksen sisältöön. Ääntämiseen liittyvä sisältö on perinteisesti erotettu oppikirjoissa omaksi osiokseen joko kappaleen tai jopa vasta kirjan loppuun. Tämä saattaa viestiä kirjan käyttäjille sisällön olevan jollakin tasolla valinnaista.

Ääntämisharjoituksia on monenlaisia, ja yksi yleinen käytäntö on foneettisten merkkien hyödyntäminen näissä harjoituksissa. Nykyisissä kirjasarjoissa tätä metodia tukee opetussuunnitelman kirjaus ”foneettisen tarkekirjoituksen” merkkien opettelusta. Suomen kielessä on lähes täydellinen kirjain-äännevastaavuus, joten foneemisen kirjoituksen järjestelmän voidaan olettaa olevan suomenkielisille käsitteenä tuttu. Foneemisessa kirjoituksessakin yhtä äännettä vastaa pääsääntöisesti yksi merkki. Englannin äänteistä useimpia kuvataan roomalaisilla kirjaimilla, jotka ovat myös suomenkielisille tuttuja. Hankaluutta aiheuttanevat pääosin ne englannin äänteet, joilla ei ole omaa grafeemia, kuten interdentaalifrikatiivit /θ/ ja /ð/. Tergujeffin mukaan foneettiset merkit ratkaisevat englannin monimutkaisen kirjoitusjärjestelmän aiheuttamat haasteet kielen oppijalle. Ongelmana on kuitenkin se, että merkeistä ei ole oppijoille hyötyä, jos heille ei niitä opeteta eivätkä he niitä opi tai osaa.

Aiemmat tutkimukset ovat osoittaneet, että vaikka foneemista kirjoitusta käytetään laajalti englannin oppikirjoissa, sitä ei juurikaan käytetä opetuksessa. Merkkien käyttämättömyyttä perustellaan usein oppilaiden iällä tai merkkien vaikeudella. Merkkejä saatetaan pitää liian vaikeina nuorille oppijoille, mutta toisaalta merkkien vaikutus äänteiden oppimiseen voi jäädä vähäiseksi äännejärjestelmän vakiinnuttua. Merkkien hallitsemisen tai käytön yhteyttä ääntämistaitoihin on tutkittu jonkin verran aikuisilla, ja tulokset ovat olleet lupaavia (esimerkiksi Kimmo Peltola kollegoineen ja Pekka Lintunen). Julkaistua tutkimusnäyttöä foneemisen kirjoituksen käytön ja äänteiden oppimisen yhteydestä suomalaisilla

alakouluikäisillä oppilailla ei ole kuitenkaan olemassa. Tässä tutkielmassa merkkien käyttöä ja osaamista kartoitettiin koeasetelmalla, johon kuului kaksiosainen elisitaatiotehtävä sekä opettajakysely ja oppimateriaalihavainnointi. Esittelen seuraavaksi koeasetelman ja sen tulokset.

Koeasetelmaa rajattiin siten, että tutkittavaksi valittiin kolme englannin äännettä, palatoalveolaarinen sibilantti /ʃ/, interdentaalinen frikatiivi /θ/ ja afrikaatta /tʃ/. Kaikki kolme ovat soinnittomia äänteitä. Valintakriteereinä käytettiin kommunikatiivista tärkeyttä, vaikeutta suomenkielisen näkökulmasta ja äänteiden symboleja eli äänteiden haluttiin olevan tärkeitä kommunikaation onnistumisen kannalta, vaikeita suomenkielisille ja merkeiltään erilaisia kuin roomalaiset aakkoset. Nämä kriteerit täyttyivät hieman eritasoisesti jokaisen valitun äänteen kohdalla.

Tutkielma rajattiin myös koskemaan vain yhden englannin kirjasarjan käyttäjiä. Kirjasarjaksi valikoitui Sanoma Pron uusin alakoulun englannin sarja *Come with me!* Kyseisessä kirjasarjassa on jokaisessa kappaleessa erillinen *sounds*-osio, jossa harjoitellaan ääntämistä ja foneettisia merkkejä. Tutkimushenkilöiden ikä valikoitui kirjasarjan ja valittujen äänteiden mukaisesti: valitut kolme äännettä esitellään useampaan kertaan vuosiluokkien 3 ja 4 kirjoissa. Tämän takia 4. luokan loppupuoli olikin sopiva ajankohta tutkia kyseisten äänteiden ja äännemerkkien osaamista sekä kirjan tehtävien käyttöä.

Mittavien yhteydenottoyritysten jälkeen mukaan lupautui yhteensä seitsemän koulua neljästä eri kunnasta. Mukana oli yksi varsinaissuomalainen suurempi kaupunki, kaksi kehyskuntaa ja yksi lähiseudun maaseutukunta. Osallistujia oli 11 eri luokalta, ja opettajia oli mukana yhteensä 10. Koulut olivat keskenään hyvin erilaisia sijainniltaan, kooltaan ja oppilaaksiottoalueiden sosioekonomiselta profiililta. Osallistujat rekrytoitiin sähköisellä lomakkeella, jonka yhteydessä toimitettiin asianmukaiset tietosuojaselvitykset ja tutkimustiedotteet. Lopullinen aineistonkeruuvaiheen otoksen koko oli 69 oppilasta, ja analyysivaiheeseen päätyi 68 oppilaan otos. Kaikki analysoidut näytteet olivat oppilailta, joilla ei ole tiedossa kielellisiä erityisvaikeuksia ja joiden huoltajalta oli saatu kirjallinen suostumus.

Oppilailta aineistoa kerättiin kaksiosaisella elisitaatiotehtävällä. Kuvatehtävässä tutkimushenkilöt näkivät tietokoneen ruudulla kuvia, ja heidän tehtävänään oli nimetä kuva englanniksi. Kuvatehtävän tarkoituksena oli kerätä näytteitä tutkimusäänteistä ja kontrolliäänteistä. Kuvissa olivat aiemmin oppilaiden englanninkirjassa esiintyneitä sanoja,

kuten ”ship” tai ”thirty”. Tutkimusäänne oli sanan alussa tai lopussa, jokainen äänne yhteensä kolmessa sanassa. Kontrolliäänteet /s/ ja /t/ esiintyivät myös kuvasarjassa. Kuvia oli yhteensä 13, joista yksi oli esimerkkikuva. Epäsanatehtävässä puolestaan testattiin foneemisella kirjoituksella esitettävien epäsanojen avulla foneettisten merkkien tuntemusta. Sarjassa oli 12 tavoite-epäsanaa ja yksi esimerkkiepäsana. Jokainen tutkimusäänne esiintyi kahdesti epäsanan alussa ja kahdesti epäsanan lopussa. Epäsanoissa oli tavoiteäänteen lisäksi yksi roomalaista grafeemia muistuttava vokaali- ja yksi konsonanttisymboli, jotta epäsanojen ääntäminen olisi tavoiteäännettä lukuun ottamatta yksinkertaista. Mukana olivat esimerkiksi epäsanat /ʃep/, /muθ/ ja /ketʃ/. Kuva- ja epäsanasarjat esitettiin eri koehenkilöille eri järjestyksessä. Oppilaat suorittivat tehtävän yksi kerrallaan luokan ulkopuolisessa hiljaisessa tilassa. Tuotokset nauhoitettiin laadukkaalla mikrofonilla ja Audacity-ohjelmalla, ja tiedostot pseudonymisoitiin anonymiteetin varmistamiseksi.

Koeasetelmassa tarkasteltiin myös osallistuvien oppilaiden tehtäväkirjoja. Jokaisen tutkimushenkilön tehtäväkirjasta katsottiin neljän ääntämistehtävän valmiusaste, ja tämä kirjattiin numeerisesti asteikolla 1–5. Mahdollisia virheitä ei huomioitu, sillä tutkimuksen kohteena oli ainoastaan se, oliko tehtävän parissa työskennelty.

Myös koehenkilöiden englannin opettajilta kerättiin vastaukset lyhyeen kyselyyn. Kyselylomakkeella kartoitettiin, kuinka ison osan kirjan sounds-tehtävistä opettaja oli oppilaillaan teettänyt ja oliko hän käyttänyt kirjan ulkopuolista ääntämismerkkimateriaaleja. Opettajille esitettiin myös avoimia kysymyksiä lisämateriaaleista sekä siitä, miksi he olivat tai eivät olleet käyttäneet kirjan sounds-tehtäviä. Vastaukset saatiin jokaiselta 10 opettajalta.

Elisitaatiotehtävien analyysivaiheessa käytettiin suhteellista analyysia, jossa tuotoksia verrattiin tavoiteäänteen kriteereihin. Tavoiteäänne itsessään oli eri kahdessa tehtävätyypissä: kuvatehtävässä tuotosta verrattiin kyseisen äänteen yleisiin akustisiin kriteereihin, kun taas epäsanatehtävässä tuotoksia verrattiin kyseisen koehenkilön omaan äännetuotokseen kuvatehtävässä. Epäsanatehtävän analyysissä käytössä oli siis yksilön sisäinen suhteellinen analyysi, jonka tarkoituksena oli tutkia nimenomaan merkkien tuntemusta, ei ääntämistaitoa yleisesti. Tuotokset analysoitiin Praat-ohjelmalla käyttäen hyödyksi sekä akustista ääniraitaa että sen pohjalta luotua spektrogrammia. Yhteensä analyysivaiheessa käsiteltiin 1 632 tuotosta, joista 816 liittyi kuvatehtävään ja 816 epäsanatehtävään. Spektrogrammeista tutkittiin tavoiteäänteiden energiakeskittymiä ja muita keskeisiä piirteitä. Kummatkin elisitaatiotehtävät pisteytettiin skaalalla 0–2. Täysin väärä vastaus sai 0 pistettä, osin oikea 1

pisteen ja täysin oikea 2 pistettä. Kuvatehtävässä vastaamatta jättämiset ja väärät sanat merkittiin N/A (ei sovellettavissa), sillä kyseessä oli oletettavasti sanastollinen ongelma, joka ei liittynyt äänteisiin. Epäsanatehtävässä asteikko oli muilta osin sama, mutta vastaamatta jättämiset merkittiin 0 pisteellä, sillä tässä tehtävätyypissä vastaamatta jättämisen oletettiin kertovan siitä, että koehenkilö ei tunnistanut kyseistä symbolia. Epäsanatehtävässä yksilön sisäinen suhteellinen analyysi merkitsi sitä, että kriteerinä käytettiin jokaisen koehenkilön kohdalla hänen itsensä kuvatehtävässä tuottamaa äännettä. Näin pystyttiin arvioimaan aidosti sitä, tunnistiko koehenkilö kyseisen symbolin, riippumatta siitä, osasiko hän tuottaa siihen liittyvän äänteen ulkoisten kriteerien mukaisesti oikein.

Tilastolliset laskut ja analyysit suoritettiin Microsoft Excel- ja R Statistical Software -ohjelmilla. Elisitaatiotehtävien pisteistä laskettiin tilastolliset tunnusluvut keskiarvo, mediaani ja keskihajonta. Tehtäväkirjaosion tulokset käsiteltiin sekä laskemalla tilastolliset tunnusluvut että tilastollisia testejä apuna käyttäen. Lisäksi käytettiin lineaarista sekamallia, jossa tehtävän sijainti kirjassa oli kiinteä vaikutus ja opettaja satunnaisvaikutus. Opettajakyselyn vastaukset puolestaan analysoitiin laadullisesti.

Elisitaatiotehtävän tulokset paljastivat, että koehenkilöt osasivat tuottaa tavoiteäänteet kuvatehtävässä huomattavasti paremmin kuin epäsanatehtävässä. Kuvatehtävässä tuotosten keskiarvot olivat seuraavat: /ʃ/-sanoissa 1,90–1,97, /tʃ/-sanoissa 1,75–1,96 ja /θ/ -sanoissa 0,47–0,97. Tässä tehtävässä /θ/ oli selvästi kahta muuta vaikeampi äänne. Epäsanatehtävässä pisteet jäivät mataliksi: kaikki keskiarvot olivat 0,00–0,47 välillä. Myös tässä tehtävätyypissä /θ/-sanoissa pisteet olivat muita äänteitä matalammat. Vain yksi koehenkilö tuotti /θ/ äänteen täysin oikein foneettisen merkin perusteella ja hänkin vain yhden kerran. Interdentaalifrikatiivin /θ/ kohdalla hajonta oli muita äänteitä suurempaa kuvatehtävässä ja ääntämismerkkitehtävässä puolestaan muita pienempää. Nämä tulokset osoittavat, että oppilaat eivät juuri tunne foneettisia merkkejä mutta osaavat silti melko hyvin tuottaa niitä vastaavia äänteitä.

Kuvatehtävän tulokset olivat pitkälti linjassa aiempien tutkimusten kanssa. Sibilantti /ʃ/ ei ollut koehenkilöille vaikea, kuten ei Lintusenkaan aiemmassa tutkimuksessa. Frikatiivi /θ/ oli koehenkilöille vaikea, kuten myös Lintusen tutkimuksessa ja Ian Morris-Wilsonin analyysissä. Äänne /θ/ korvattiin useimmiten /t/-äänteellä, kenties kirjoitusasun takia. Afrikaatta /tʃ/ oli näissä tuloksissa yllättävän tarkasti tuotettu, toisin kuin Lintusen aineistossa. Epäsanatehtävistä voitiin odottaa kauttaaltaan matalia pisteitä, kun otettiin huomioon aiemmat

tutkimukset, joissa on käsitelty foneettisten merkkien käyttöä englannin opetuksessa. Oli kuitenkin yllättävää, kuinka lähellä nollaa tulokset ylipäätään olivat. Täydet pisteet (2 pistettä) olivat erittäin harvassa, ja vastaamatta jättämiset hyvin yleisiä. Koehenkilöt tuottivat äänteitä pääosin foneettisen symbolin muodon perusteella arvaten, esimerkiksi tulkitsemalla symbolin /ʃ/ kirjaimeksi <f>. Vastauksena tutkimuskysymykseen voidaan täten todeta, että oppilaat eivät vaikuta juurikaan osaavan foneettisia merkkejä. He osaavat kuitenkin tuottaa niitä vastaavia äänteitä melko hyvin, vaikkakin äänne /θ/ aiheuttaa monille hankaluuksia.

Tehtäväkirjaosiossa kirjattiin ylös neljän eri puolilta kirjaa löytyvän tehtävän valmiusaste. Valmiusastepisteiden keskiarvot olivat 3,9; 2,8; 2,4 ja 2,0 ensimmäisestä tutkitusta tehtävästä viimeiseen. Tuloksissa on nähtävissä laskeva tendenssi. Lineaarisella sekamallilla saatiin seuraava tulos: Pearsonin korrelaatiokerroin toiseen potenssiin korotettuna tarjosi kirjasijainnin ja opettajan yhteiseksi selityskertoimeksi 0,509, eli 50,9 prosenttia vaihtelusta voidaan selittää näiden kahden tekijän vaikutuksella. Pelkän kirjasijainnin selityskerroin oli 0,126 ja opettajan selityskerroin 0,383. Waldin testi osoitti kirjasijainnin vaikutuksen *p*-arvoksi 2.2e-16, kun opettajan vaikutus on huomioitu. Tulos on siis tilastollisesti erittäin merkitsevä.

Opettajakyselyn vastaukset osoittivat, että sounds-tehtävien käyttö neljännellä luokalla oli vaihtelevaa eikä kaiken kaikkiaan kovin yleistä. Neljä kymmenestä opettajasta kertoi käyttäneensä alle neljäsosaa tehtävistä, kaksi oli käyttänyt noin puolta tehtävistä ja kolme suurinta osaa. Yksi opettaja kertoi käyttäneensä kaikkia tehtäviä. Yksi opettaja kertoi avoimessa kentässä käyneensä aluksi sounds-tehtäviä systemaattisesti läpi, mutta joutuneensa ”kirimään” lukuvuoden edetessä. Kolme opettajaa kertoi käyttäneensä myös kirjan ulkopuolisia foneemisen kirjoituksen materiaaleja, seitsemän ei. Syiksi olla käyttämättä foneemista kirjoitusta opettajat mainitsivat useimmiten ajanpuutteen ja muun materiaalin priorisoinnin. Opettajat mainitsivat myös sen, että heillä ei ole aikaa ”ylimääräisille” asioille. Opettajat käyttivät foneemista kirjoitusta, koska tehtävät ovat heidän mielestään hyviä ja oppilaat pitävät niistä.

Tehtäväkirjaosion ja opettajakyselyn tulokset täydensivät toisiaan. Opettajakyselyn vastaukset koskivat kouluvuotta kokonaisuutena, kun taas tehtäväkirjaosion tulokset kuvasivat tilannetta kouluvuoden edetessä. Lineaarinen sekamalli kuvasi, kuinka tehtävän sijainti kirjassa – ja siten kouluvuoden tietyssä kohdassa – vaikutti tehtävän valmiusasteeseen. Vaikuttaa siltä, että alkuvuodesta tehtäviin panostetaan enemmän, mutta loppuvuodesta ne jäävät kiireen ja

priorisoinnin takia usein osin tai kokonaan tekemättä, kuten yksi opettaja avoimessa vastauksessaan kertoikin. Opettajavaikutus oli huomattava ja on linjassa esimerkiksi Pronunciation Teaching in Europe Survey -tutkimuksen tulosten kanssa. Opettajat ovat keskenään eri mieltä foneettisten merkkien käytöstä opetuksessa, ja tämä heijastunee vaihtelevuuteen tuloksissa. Yksi tämän tutkielman keskeinen löydös on, että opettajat mieltävät foneettisten merkkien käytön ”ylimääräiseksi” sisällöksi. Tähän asiaan kustantajilla olisi mahdollisuus vaikuttaa muuttamalla tehtävien sijoittelua kirjoissa. Foneettisten merkkien pitäminen ylimääräisenä tuli esiin myös esimerkiksi Tergujeffin tutkimuksessa vajaa vuosikymmen sitten. Huomionarvoista kuitenkin on, että nykyisten neljännen luokan opetusryhmien kohdalla ”foneettisen tarkekirjoituksen” harjoittelu on ollut kirjattuna opetussuunnitelman perusteisiin heidän koko kouluaikansa. Tehtäväkirjaosion ja opettajakyselyn perusteella voimme todeta, että foneettisia merkkejä käytetään opetuksessa mutta ei säännönmukaisesti eikä yhtenäisesti. Aikapaine ja muun sisällön priorisointi ovat yleisimpiä syitä olla käyttämättä niitä.

Tässä tutkielmassa oli sekä vahvuuksia että heikkouksia. Validiteettia vahvistaa muuttujien huolellinen operationalisointi. Validiteettia olisi voinut parantaa sisällyttämällä koeasetelmaan kattavamman otoksen englannin foneemeja. Otos on vahva sikäli, että se on melko monipuolinen ja siten edustava. Suurempi otos olisi luonnollisesti tehnyt tutkielmasta vielä vahvemman. Myös useamman näytteen elisitoiminen jokaisesta tavoiteäänteestä olisi vahvistanut löydöksiä. Reliabiliteetti olisi vahvistunut sillä, että tuotoksia olisi ollut analysoimassa useampi tutkija. Selkeät piirteet tutkimustuloksissa kuitenkin viittaavat siihen, että tulokset saattaisivat olla samansuuntaisia muillakin otoksilla, vaikka tutkielma rajoittuikin vain yhteen ikäryhmään ja kirjasarjaan ja tutkittavia äänteitä oli rajallinen määrä.

Tutkimustuloksista voidaan päätellä, että oppikirjoissa käytetyt foneettiset merkit eivät tällä hetkellä välttämättä toimi kuten on tarkoitettu. Oppilaat eivät tunne merkkejä, vaikka niitä esitellään kirjoissa ja niihin liittyviä tehtäviä myös tehdään, ainakin jonkin verran. Olisi kenties paikallaan arvioida, tulisiko materiaaleihin ja niiden käyttöön tehdä muutoksia. Nykyisellään vaikuttaa siltä, että foneettiset merkit ovat esillä kirjoissa ja tehtävissä ilman että niiden hyödyllisyyttä on aidosti arvioitu. Tarvitaan lisää tutkimusta, jotta saadaan kattavampi kuva foneemisen kirjoituksen käytöstä ja hyödyllisyydestä suomalaisissa alakouluissa. Sähköisten oppimateriaalien mahdollisuuksia ääntämisen oppimisen kehittämisessä olisi myös tarpeen kartoittaa.