PIRATES AND PRONUNCIATION

English consonant pronunciation skills of Finnish-speaking second-graders knowing no English

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Tiivistelmä – Abstract

Kieltenopetus varhentuu Suomessa, ja vuodesta 2020 alkaen suomalaiset lapset aloittavatkin vieraan kielen A1-opinnot jo ensimmäisellä luokalla. Tämän tutkielman tarkoituksena on selvittää, voiko lyhyt opetusinterventio vaikuttaa 7–8-vuotiaiden lasten englannin konsonanttien ääntämistaitoihin ja foneettiseen tietoisuuteen. Fonologisten taitojen roolia lukemiseen oppimisessa on tutkittu Suomessa sekä maailmalla, mutta vieraan kielen oppimisen näkökulma on jäänyt vähemmälle huomiolle.

Tutkimuksen ensimmäinen teoriaosuus käsittelee varhennettua kieltenopetusta ja iän yhteyttä kielten oppimiseen. Toisessa teoriaosuudessa tarkastellaan suomen ja englannin konsonanttijärjestelmiä, fonologisen tietoisuuden teorioita sekä ääntämisen ja fonetiikan opettamista.

Tutkimusta varten järjestettiin kaksi eri opetusinterventiota. Yksi ryhmä toisen luokan oppilaita sai kahdeksan viikon ajan englannin äänteisiin keskittyvää opetusta, jossa hyödynnettiin merirosvoaiheista materiaalipakettia, kun taas toinen ryhmä opiskeli kielisuihkutustyylisesti englannin sanastoa ja lyhyitä fraaseja. Kontrolliryhmä ei saanut minkäänlaista englannin opetusta. Yhteensä 120 oppilaan foneettisia taitoja testattiin äänteiden erottelutehtävän avulla interventioita ennen ja niiden jälkeen.

Tulokset osoittavat, että englannin äänteitä opetellut ryhmä kehittyi äänteiden erottelussa tilastollisesti merkittävästi usean äänteen kohdalla. Kielisuihkutus- ja kontrolliryhmän kehitys oli maltillisempaa, eikä merkittävää kehitystä havaittu kuin muutaman äänteen kohdalla. Tuloksista voidaan siis päätellä, että lyhytkin interventio voi kehittää lasten vieraan kielen äännetietoisuutta.

Asiasanat – Keywords

early language learning, phonology, phonetics, pronunciation, phonological awareness

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1 INTRODUCTION

Early Foreign Language Learning (FLL) is a current issue in Finland. The new regulation, which will affect all schools nationwide, states that all children starting first grade in August 2019 will begin to study a second language during their first year of school instead of the third. During the first two years of school, children will receive, on average, one to two hours of language teaching per week (Ministry of Education and Culture 2018). National policies have the potential to provide equal learning opportunities for all children (Enever 2011: 25), and, according to the Finnish Ministry of Education and Culture, this regulation is meant to assure this equality, regardless of one's geographical location, as until now, only few municipalities and cities have been able to offer foreign language teaching for first or second-graders. Another important reason behind the interest towards earlier FLL is the question of sensitive periods, which entails that language learning could be facilitated from childhood up until one's teenage years. *The earlier the better* point-of-view is not unique to Finland, as the idea has been vouched for in the European Union for several years. A number of policies emphasizing the importance of linguistic competences have been drafted, and since the 2006 Barcelona European Council, learning at least two foreign languages in a young age has been one of the main objectives of EU language policy (European Commission 2011: 4).

In previous research conducted in Finland, little (or no) attention has been paid to the phonological skills of young foreign language learners. This is understandable since, so far, in the Finnish context, pupils typically begin their language studies around the age of nine, which means little systematic language teaching has been directed to learners younger than that, say, ages six or seven. While bilingual children have been studied to a great degree, their situation cannot be equated to the one of foreign language learners. Similarly, research has been conducted on the development of phonological skills in one's L1 (see. e.g. de Jong, Seveke & van Veen 2000; Puolakanaho 2007; Puolakanaho & Ketonen 2011; Marecka 2018), but, again, without the foreign language perspective. Some studies that have considered phonological awareness in relation to second language reading (see Bernhardt 2000, for a review), however, as there are salient language specific differences across languages, we should be cautious about adopting their findings to the Finnish context. While these studies could offer us important and applicable information from a certain point of view, research focusing specifically on early FLL

would be needed to help teachers have a better understanding of their pupils' phonological skills as well as of suitable teaching methods. We hope that our study could shed some light on this current matter and provide language teachers with some useful information specifically on which foreign, English consonant sounds are prone to be the most problematic ones for the Finnish-speaking pupils, as well as which methods would be likely to have the best effect for mastering them.

The aim of this quantitative experimental study was to examine the production of English consonant phonemes by Finnish-speaking second-graders (N=120) with no previous experience studying the language. The objective was to discover to what extent these children are able to pronounce certain English consonants and whether short-term teaching interventions have an effect on their consonant production performance. Two different interventions were carried out in this study. The first one concentrated on raising phonetic awareness, whereas the other one consisted of language showering with the focus mainly on learning vocabulary. To compare the general effectiveness of the teaching interventions on children's phonetic skills, a control group that received no English teaching was also included. The three research groups, i.e. Phonetic awareness group, Language showering group and Control group were tested on their consonant production skills before and after their eight-week intervention periods.

The experiment was part of a project called *Kielitaito kuuluu kaikille* (English: Language skills belong to everyone), which was carried out by Niilo Mäki Institute (NMI) and funded by the Finnish National Agency for Education as a response to the aforementioned changes about to occur in the Finnish school system. NMI was responsible for the pirate-themed material package applied in the phonetic awareness intervention in our study. The package was created specifically to introduce second-graders to the English sound system, and to train their phonetic awareness skills (Niilo Mäki Institute 2019). Phonetic awareness refers to a phonological skill that enables one to "explicitly manipulate speech segments at the phoneme level" (Cunningham 1990: 429), an essential skill when learning to read. The kind of phonetic awareness our study focused on is called *segmenting*, which deals with breaking a word apart into separate phonemes. With the help of segmenting tasks, we examined how able pupils were to produce single consonant sounds of English.

Language learning is known to be a very complex process in which various individual, yet intertwined factors play a part. Consequently, the issue can be viewed from a variety of

perspectives. As the focus of this thesis is on early language learning and learning sounds of English, we will first discuss the process and the factors of early language learning in different L2 contexts, as well as in the Finnish educational environment. We will then look into the area of phonology, with attention especially to the Finnish and the English sound systems. The remainder of the paper is devoted to reporting the results and answering the research questions of the study in question.

2 EARLY FOREIGN LANGUAGE LEARNING

In this chapter, we will discuss some of the main issues related to early foreign language learning. English is commonly considered a foreign language in Finland, and it is labelled accordingly in the National Core Curriculum (2016: 236). However, its prominent status in the society could, perhaps, allow it to be called a second, rather than a foreign, language to many Finns. As Leppänen et al. (2009: 20) point out, English is the foreign language that is most used in Finland. The distinction between an L2 and an FL is not always straightforward, and the term L2 can sometimes refer to both depending on the context (Ortega 2009: 6). However, despite its prevalence in the society, the authors of this paper consider English a foreign language. Thus, in the context of the present study English will be called a foreign language (FL) instead of a second language (L2), unless the term L2 is used in a reference study. The original concepts used in reference studies will not be altered. For further discussion on these different language learning contexts, see section 2.4 on early foreign language learning in Finland.

Another term that requires a definition is early foreign language learning. As the subject of early FLL has only recently surfaced in the Finnish context, there is still a gap in terminology. In English, the concept of early language studies can be referred to as early Foreign Language Learning, or early FLL. In Finnish, the terms *varhentaa* (to make earlier) and *varhennettu kieltenoppiminen* (earlier language learning) have become more and more common, but as Skinnari and Halvari (2018: 2) explain, terms related to the subject of making something earlier are always connected to a change in the prevalent system, relative to a previous situation, being, thus, context-related. This means the terms themselves are vague without a context, because the distinction between *early* and *late* is unclear without any comparison point. In the Finnish context, the term *earlier language learning* is applied when one's first foreign language studies begin before the third grade, since the third grade has been the standard starting point until now (Skinnari & Halvari 2018: 2).

Although the age factor is in the center of this thesis, it should be acknowledged that learning a foreign language is a very complex and individual process, and that one single factor should not be given too much emphasis. However, since earlier FLL is a current issue in Finland, it is important to discuss the characteristics of language learning in childhood to accommodate the needs of young learners. Muñoz and Singleton (2011: 25) are only some of the researchers to

remind us of the more holistic view of factors affecting foreign language learning. They list a number of additional dimensions, such as socio-affective, cognitive and contextual factors that affect the learning of a FL, arguing these factors besides age should be given more attention. However, they do recognize the effect that age has on foreign language learning. Today, approaches with emphasis on learning by doing and by interacting with others appear to be popular in the school world. The objectives listed in the latest Finnish Core Curriculum (NCC 2016) are also based on the (socio-)constructivist view that a learner is an active being who learns by actively working together with other people. This view is also one we agree with; we believe it is important to see learners as socio-cognitive beings and to acknowledge that learning does not occur in a vacuum.

Due to the complexity of theories and viewpoints in the field of FLL, it is impossible to cover every aspect affecting language learning and phonetic skills. In spite of the fact that there are, in addition to the age factor, multiple other elements affecting the process of learning a foreign language, we believe that the nature of the relationship between age and language learning should be of special interest in research. Thus, our focus will here be on age and, more specifically, on the different varieties of the critical period hypothesis.

2.1 Critical Period theories

In this section, we will discuss the much-debated notions of sensitive and critical periods. While different theories vary regarding their suggested number or length of such periods, the basic idea of a critical period entails that there is a biological stage after which "the processes and outcomes of L2 acquisition are fundamentally and irreversibly changed" (Ortega 2009: 12). Learning the phonology of an FL is viewed as the "greatest challenge for late learners" (Moyer 2013: 22), and the reasons behind this phenomenon have been under scrutiny for decades. Lenneberg (1967a) was a pioneer in the field with his Critical Period Hypothesis (CPH) concerning optimal age for learning a language, however, his theory concerned mostly the development of the first language (L1). Therefore, the effect of maturational factors in FLL has been questioned. Other more recent theories on language acquisition offer alternative explanations for L2 learning, some of which will be discussed later in this chapter. It is good to bear in mind that in the field of second language acquisition (SLA), the two terms, critical and sensitive period, are often considered nearly synonymous (Ortega 2009: 13), since the distinction between them is difficult to make. Although earlier language learning, and thus the

idea of a sensitive period, is supported in many European countries' language policies today (European Commission 2011: 4), the relation between age and foreign language acquisition is not a given, and a unanimous view among researchers does not yet exist.

Lenneberg's (1967a) CPH is must be one of the best-known theories of a child's language learning. According to this theory, language acquisition occurs effortlessly during "a certain developmental stage" and becomes clearly more demanding after this period (Lenneberg 1967a: 142). As Singleton and Lengyel (1995: 30) explain, the effortlessness in learning a language during this critical time period would show, for instance, in how one is able to adapt to new morphological, syntactic, lexical and phonological patterns of a language. The adaptability of the brain is based on biological maturation. The CPH theory suggests that the critical period for L1 speech acquisition begins as soon as the brain is mature enough to create speech and ends when there is a "loss of adaptability and inability for reorganization in the brain" (Lenneberg 1967a: 179). Thus, the suggested critical period would start around the age of two or three and terminate after puberty (Lenneberg 1967a: 158). The way Lenneberg could determine a child's linguistic sensitivity to be between birth and puberty was by examining the human brain, its plasticity and the two hemispheres. For one thing, language functions gradually become increasingly concentrated in and controlled by one of the brain's two hemispheres: the left hemisphere instead of the right (Lenneberg 1967b: 65). What is more, humans have higher cerebral plasticity – that is, the ability for brain to adapt and shape – in childhood compared to the time after puberty. Lenneberg (1967a: 176) contended that this loss of plasticity in brain, as well as the interhemispheric specialisation, would be the explanation for why learning a language at an older age is so hard.

Lenneberg discusses the theory mainly in the light of L1 learning, but also touches on FLL. He acknowledges that learning a foreign language is possible for learners "after the beginning of their second decade" but proposes that "the incidence of 'language-learning-blocks' rapidly increases after puberty" (Lenneberg 1967a: 176). He suggests that it is possible to learn to communicate in an FL, but that "[f]oreign accents cannot be overcome easily after puberty" (Lenneberg 1967a: 176). He adds that FLL requires "conscious and labored effort" after puberty, since "automatic acquisition" is no longer possible (Lenneberg 1967: 176). Therefore, although Lenneberg's CPH entails that one can achieve a native-like command even in an FL, given that the learning starts within the critical time period, it does not, however, imply that everyone exposed to a certain language during that time would automatically become fluent in

the language. The more important notion deriving from the theory is that if the learning of the language begins *after* the critical period, one is no longer able to master the language in a native-like manner. As strong as a clam this might sound, the evidence that supports the CHP theory seems to exist in what we know about biology and the processes in our brain, as described above.

Despite its prominence and influence in the field of linguistics, the CPH has also received a great deal of opposition. Lenneberg's ideas on FLL (described above) have been challenged and criticized, as several studies have showcased that efficient and successful language learning is possible even after the alleged critical period. Older learners, because of their more developed cognitive skills, have been found to be in a superior position in second language learning, especially when it comes to short term learning in a formal context where one gets to make use of explicit learning mechanisms (Muñoz 2006: 33–34). On the contrary, younger learners seem to benefit from implicit learning in contexts where the exposure to the target language is frequent enough (Muñoz 2006: 33–34). This entails that the age of onset in language learning seems to have more relevance when it comes to implicit learning (Muñoz 2006: 34). However, it is worthy of mentioning that the long-term effects of implicit learning are hard to prove. There is evidence also for the fact that adult learners (or learners at the age of puberty) are able to master a second or a foreign language, and become native-like in many, if not all, linguistic areas. One example of an exceptional adult language learner is Julie, who acquired a foreign language extremely well, almost to be mistaken for a native speaker. Julie was a native British English speaker who mastered the Arabic language without language tutoring (Ioup, Boustagui, El Tigi & Moselle 1994). Julie moved to Egypt with her husband at the age of 21 and was able to acquire the language naturally by interacting with the locals.

A study carried out by Hakuta, Bialystok and Wiley (2003) tested the critical period hypothesis by studying native Spanish and Chinese-speakers residing in the US. The aim of the study was to decipher whether there is a discontinuity in the age effect, i.e. whether proficiency in English, the respondents' L2, drastically declines after a certain age of initial exposure to the language. The data was gathered from the 1990 US census, and responses from 2.3 million native Spanish (n=2,016,317) and Chinese (n=324,444) speakers were used to create an image of the relationship between the age of initial exposure and success in a second language. Success in English was determined based on the speakers' own evaluation of their language skills, and this information was compared to the age of arrival (AoA) in the US. This way it was possible to

see whether the AoA has an effect on later language skills. The results show that second language proficiency appears to steadily "decline with increasing age of initial exposure", but that there is no clear cut-off point at 15 or 20 years of age. Thus, Hakuta et al. (2003: 37) suggest that there is potential for language learning in people of all age, but that the deterioration of one's cognitive skills may hinder the process. Therefore, this study contradicts the claims of the CPH, since no cut-off point in language learning was detected.

As the CPH has, in light of some studies, failed to fully explain the L2 learning phenomenon, a range of new theories with alternative explanations other than solely maturation have emerged. Speech Learning Model (SLM) (Flege 1995), Perceptual Assimilation Model (PAM) (Best 1995), and Native Language Magnet (NLM) (Kuhl 1993) are all theories concerning language learning in a L2 setting. All three theories assume that the fact that adults have acquired an L1 plays a role in their ability to discriminate non-native speech contrasts (Best, McRoberts & Goodell 2001).

The SLM (Flege 1995: 238) attempts to refute the claims of the CPH by arguing that successful learning of new L2 sounds is possible even after childhood. One of the postulates of the model is that the mechanisms used in L1 sound learning can be applied to L2 learning and that those processes "remain intact over the life span" (Flege 1995: 239). The SLM studies how adults learn new phonemes (Best et al. 2001) and attempts to explain the age-related limits in the accurate production of L2 vowels and consonants. New phonological categories are easier to create for phonemes that differ significantly from close native phonemes (Best et al. 2001). This model focuses mostly on "the ultimate attainment of L2 pronunciation", which is why the theory has been studied from the perspective of experienced bilinguals instead of language learning beginners (Flege 1995: 238). The theory states that without accurate perception of L2 sounds, their production is, consequently, not accurate. Thus, the model claims that errors in second language production have a "perceptual basis" (Flege 1995: 238). For further discussion on the relationship between perception and production, see the later chapter 3.3.2.

The Perceptual Assimilation Model (PAM) is based on the notion that phonological classes created for the native language affect non-native speech perception (Best et al. 2001). As the name of the theory suggests, assimilation is a key concept in PAM. It claims that when it is possible, listeners prefer to assimilate non-native sounds to native sounds according to similarities in articulation (Best et al. 2001). While even the same sounds across languages tend

to differ in some features of their quality across languages, it seems more practical to assimilate the new sounds into the already existing categories of the L1. According to PAM, non-native phonemes are assimilated into the native-language phoneme system in three different ways. First, the non-native phoneme can be categorized as an adequate or poor example of one native phoneme. Second, it can be perceived as an uncategorized phoneme that "falls between" two or more native phonemes. Third, a non-native phoneme can be perceived as an example of nonassimilable nonspeech that does not resemble any native phoneme (Best et al. 2001). The perception of non-native phoneme contrast is less difficult when the contrasting phonemes are "separated by native phonological boundaries" than when they are assimilated to the same native phoneme. If a sound is perceived as nonspeech, this neither aids nor hinders perception.

Kuhl's (2000) NLM theory also discusses perception-related issues, suggesting that critical commitment to a specific language and its sounds occurs already during infancy. Infants are understood to categorize the sounds and sound patterns they repeatedly hear around them into a sound map, a process which would then alter their brain to perceiving the L1 in question (Kuhl 2000: 11852). Once certain sounds already exist mapped in the brain, supposedly already by six months of age, they "function as a magnet" (Kuhl 2000: 11853), facilitating the learning of similar sound patterns while interfering with the learning of foreign ones (Kuhl 2000: 11855). Based on this understanding, it is not only the maturational effect that is in play in language learning, but also the reality that the already learned affects the learning of the new, no matter the age of learning. Someone learning a new language can experience great interference from his or her L1 because of the specific way the brain has been wired in contact with the first language (Kuhl 2000: 11856).

Similar ideas related to the connection between first language knowledge and foreign language learning emerge from other research, as well. Sajavaara and Dufva (2001: 248) note that to learn a foreign language, the "feature detection system" of one's mother tongue has to be modified, and new "perceptual categories" must be created. Huotilainen (2019: 240–242) agrees with this notion, explaining that a variety of changes must occur in one's perceptive system in order to learn a foreign language. That is, the sounds of the new language must be added to the phonetic map so that the perceptive system can perceive the sounds of the target language. The alteration process does not here refer to something forced upon the learner, but simply highlight the fact that the changes in one's phonetic map occur as a natural consequence of exposure to the sounds of the target language. An example of languages that have

phonetically similar maps would be Finnish and Estonian. This entails that, for a Finn, fewer modifications would be required for learning Estonian than learning a phonetically very different language, such as the tonal Chinese (Huotilainen 2019: 250–251). According to Huotilainen, if a child does not hear or study any foreign languages before the age of ten, his or her hearing system will be locked, i.e. perceiving and pronouncing foreign sounds becomes more challenging (Huotilainen 2019: 249).

According to Kuhl, the problem of interference from one's L1, which would prevent one from successfully learning new languages, could be avoided only if the learning of the languages began early enough in one's development (Kuhl 2000: 11856). According to Huotilainen (2019), from the point of view of the brain, the ideal age to begin to study a foreign language would be at the age of three. At this stage, the phonetic map in a child's brain is still very adaptable, and learning to perceive the sounds of a new language would, in theory, be more effortless than once the mapping is complete (Huotilainen 2019: 242). She adds that the age at which the phonetic map is "locked" and final depends on the individual, but that some musical hobbies, such as singing in a choir, can maintain some flexibility in one's phonetic map. What is more, she argues that being bilingual or studying multiple foreign languages can make it easier for one to learn new phonetic systems even later in life (Huotilainen 2019: 243).

Perhaps the applicability of the CPH theory to FLL would already have been abandoned if it was not for the evidence related to phonological development in SLA and puberty. It is often the case that a non-native speaker, no matter how proficient in other parts of language, can be recognized by his or her accent (Singleton & Lengyel 1995: 30). However, as the *intelligibility principle* (Levis 2005: 370) holds, if a foreign-sounding accent does not interfere with communication and intelligibility, it should not be considered a problem. In our opinion, studying the link between age and pronunciation should, thus, be done without over-emphasizing the importance of native-like pronunciation. Nevertheless, the connection between biological factors and pronunciation appears to be quite strong. Scovel (2000: 219) suggests that pronunciation as a linguistic area actually differs from other areas in how it is more connected to biology through the connection between neurology and muscular programming. This way, pronunciation is affected by the loss of plasticity that occurs during puberty. Scovel would argue that because of these biological reasons, after the critical period, around the age of 12, it is *impossible* for learners to attain a native-like pronunciation in a non-native language (Scovel 1988, cited in Singleton & Lengyel 1995: 44), whereas other linguistic domains may

still develop to reflect a native-like command. Similarly, Long (2013: 5) claims that Age of Onset (AO), i.e. the age of first exposure to a FL, has a great effect on pronunciation. Attaining a native-like pronunciation is likely between an AO of zero to six, less likely but still possible between six and twelve, but impossible after the age of twelve (Long 2013: 5). Nevertheless, there are cases of exceptional adult language learners with native-like pronunciation, like Julie, whose case was discussed above (Ioup et al. 1994).

The apparent uniqueness of the relation between biology and pronunciation has led some researchers to believe that the CPH applies *only* to the phonological components of language learning (Scovel 1988, cited in Fullana 2006: 41). Then again, there are some who believe phonology to be simply the first or the main area that is affected by the critical period phase (Singleton & Lengyel 1995: 31–32). The idea of different linguistic areas having their own, separate critical periods has also been proposed by many (see e.g. Singleton & Ryan 2004: 84–94; Singleton 2005). This view aligns with Long's (2013: 5) notion of many Sensitive Periods (SPs). According to him, there is some variability between individuals regarding the onset and offset of their sensitiveness to language. Thus, unlike a unitary critical period view, this idea suggests that distinct language acquisition abilities would gradually decline at their own rate, some sooner than others. There is still some "residual plasticity after the period of peak sensitivity ends", so the offset phase of a sensitive period is more gradual than sharp (Long 2013: 5). Seliger (1978: 16) also supports such view of multiple, "successive and perhaps overlapping" critical periods, basing his argument on the changes in the brain activity processes. According to him, there are some specific processes in the brain, more specifically intrahemispheric specialisation, as opposed to interhemispheric specialisation, that continue even after puberty, suggesting preserved brain plasticity for those distinct linguistic functions (Seliger 1978: 16, 18). He suggests that the first ability to be lost due to the closing of its critical period, "not much beyond the onset of puberty", is the one that concerns abilities to acquire a native accent (Seliger 1978: 16). This, of course, is not surprising to us, since acquiring a native accent is a process that requires the apparently such unique phonological abilities. The distinct nature and more detailed characteristics of phonology will be further explained in a later chapter 3.3.

To conclude, while there is no widely accepted consensus of the true nature of critical or sensitive periods and their connection to foreign language learning, previous neurological research seems to support the idea that there are certain benefits to an early start, e.g. because

of the development of phonological maps in childhood. While late starters can become experts in many linguistic areas, the long-term effects of an early start seem to be manifest mainly in the area of phonology.

2.2 Children as foreign language learners

Children are commonly seen as good language learners (Alexiou 2009: 46). For some reason, they seem to be able to pick up the language of their living environment faster and more successfully than adult learners in the same context (Griffiths 2008: 36–37). Although previous research has explored this phenomenon for years and generally suggested the superiority of a young age in the matter of foreign language development (Griffiths 2008: 307), it is not clear to what extent this belief can be generalized to apply to formal, school context FLL. Today, research acknowledges strengths of both children and adults in the process of language learning (Griffiths 2008: 35–36). While the critical period theories, which are discussed above, attempt to explain the issue from a biological perspective, here, we will discuss other points of view, taking into account factors such as cognitive skills, individual differences as well as social and environmental situations. It needs to be acknowledged, however, that these are only some of the variables of a much more complex process. As Griffiths (2008: 40–41) puts it, there is "almost infinite number of individual variables which might affect student's ability to learn language".

As of yet, there is no language learning model that would explain the FLL processes of very young learners (Milton & Alexiou 2006). However, especially for teaching purposes, it would be important to learn about the language acquisition processes of young learners. According to Alexiou (2009: 47), the level of cognitive development is one of the crucial factors determining one's performance of foreign language learning. Alexiou explains that same-aged children can be at different stages in their cognitive development. Consequently, the differences in stages of cognitive development are far greater between children and adult learners, which characterizes their FLL processes. Unlike adults whose linguistic skills have had time to mature, young learners' linguistic abilities are still developing (Alexiou 2009: 49). It is then obvious that such developmental, age-related facts are connected to the ways in which these age groups learn a language. In other words, older learners tend to learn complex systems, such as verb use, faster than children, however, in the long-term, children who start their language learning at an early

age usually catch up or even go beyond the level of the once superior late starters (Griffiths 2008: 35–36).

Individual difference (ID) research is interested in traits that make individuals different from each other (Dörnyei 2005: 1), and these differences can be used to explain why some language learners fare better than others. Individual differences include, for instance, attitude, gender, motivation and personality. One such feature whose effects have been studied to a great extent is called language aptitude. Dörnyei (2005: 32) suggests that the terms *language aptitude* and *language learning ability* are often used interchangeably. Alexiou (2009: 46) describes language aptitude as an individual characteristic of one's "natural ability to acquire language at a fast and easy rate". In other words, a person with high language aptitude would learn language more quickly and easily as opposed to a person with low language aptitude. It appears that aptitude is not language specific, therefore applying to all linguistic learning, i.e. a person with a high aptitude would learn any language better than a person with a low aptitude, regardless of language background (Alexiou 2009: 48).

Language aptitude has generally been connected to and classified as a cognitive skill or a set of skills, and aptitude in young learners can be said to consist of "a set of memory, analytic and phonetic skills" (Skehan 1989, cited in Alexiou 2009: 50). These components have been studied in native and foreign languages alike, as native language skills are, according to Sparks and Ganschow's (2001) *linguistic coding differences hypothesis* (LCDH), known to serve as a base for FLL. The LCDH includes three hypotheses: 1) native language abilities are the foundation for FLL; 2) problems in, for instance, phonology occur both in native and FL learning; 3) learners have "innate individual differences" that affect language learning (Sparks & Ganschow 2001: 97). Sparks, Ganschow, and their colleagues have found that successful FL learners have better phonological, orthographic and syntactic skills in their native language than unsuccessful learners (Sparks & Ganschow 2001: 97). They have also been able to prove that successful learners have higher scores on aptitude tests. What is more, the results gathered from various studies support the significance of the "phonological code for successful FL learning" (Sparks & Ganschow 2001: 98). To support these findings, the observations by Durgunoglu, Nagy and Hancin-Bhatt (1993: 453) show that Spanish-speaking first-graders' phonological awareness and word recognition skills are strong predictors of success in English word recognition tests. Similarly, pseudoword repetition tasks have shown that phonological memory skills of Finnish children function as a predictor of learning English (Service 1992, cited in Sparks & Ganschow

2001: 99). Finally, language aptitude is not only a strong predictor of academic success in FLL, but it has also been found to be the individual difference that in general affects school performance the most (Dörnyei 2005: 31).

Understanding the benefits of high language aptitude for language learning, one should wonder whether such a useful feature was possible for anyone to get hold of. Although aptitude has previously been described to be innate and relatively unchangeable, Alexiou (2009: 57) suggests that it could be possible that aptitude becomes stable after a child's cognitive skills have matured, which would suggest a connection to the loss of plasticity, i.e. aptitude could possibly be trained in childhood. He explains that aptitude seems to progress along with other cognitive skills and keep progressing until a cognitive peak has been reached. It is then not likely that language aptitude, if seen as a cognitive ability, would in its quality be the same in one's childhood and adulthood (Alexiou 2009: 49). Therefore, aptitude might not be completely fixed from the start, and there could be hope for anyone to develop it, at least in childhood. Alexiou (2009: 57) suggests that with proper instruction and aptitude testing, learners' weaknesses could be "alleviated" if anticipated early enough. Griffiths (2008: 307), who also supports a dynamic view of aptitude, points out that ways for teachers to actually increase learners' aptitude (with the help of cognitive and metacognitive strategies) have already been demonstrated by some (see. e.g. Feuerstein, Klein & Tannenbaum 1991). While this development in aptitude is deemed possible in young learners, the way it might manifest in adults remains unclear (Milton & Alexiou 2006: 608).

Johnstone (2009) discusses some characteristics of young and older language learners in terms of intuitiveness and analyticity. He argues that one of the advantages of younger learners is the fact that, by starting early, pupils can utilize more of their naturally developing cognitive capabilities (Johnstone 2009: 34). By that he means that the learning processes of younger children are characterized by certain intuitiveness, whereas later in life learning becomes more analytical. However, Milton and Alexiou (2006) report that among children as young as five "good language learners are analytic and explicit", which could, perhaps, suggest that analyticity is a trait that successful learners of all ages have in common. The analytical nature of studying in older learners is seen in how they are expected to know more language learning strategies, have better abilities in metacognition and have better explicit grammatical understanding (Griffiths 2008: 40, 307). Quite evidently, to those making an early start, "both sets of advantages" are available, first, the intuitiveness of a child and, later, the skillset of an

analytical adult. Alexiou (2009: 57) points out that while some cognitive skills like memory deteriorate with age, analytical skills are prone to improve. As the information load in the brain increases over time, the ability to organize information becomes more important (Alexiou 2009: 57). This ability to deal with great amounts of information and organizing it in useful and meaningful ways would, then, be another example of adults' strengths in learning. In addition to more advanced analytical skills, the ability to learn patterns quickly seems to be an advantage for older language learners, and they usually perform better than younger learners in the short term (Moyer 2013: 21).

One rather obvious advantage of adult language learners is that they have already acquired more general life experience and knowledge about studying and learning than children, which can facilitate their language learning processes. Johnstone (2009: 34) explains that by adulthood, individuals have gathered important conceptual information about the world and about different communicative situations, learned various study methods and strategies of meaning negotiation. While younger learners might lack this type of knowledge, their ability to learn implicitly could compensate this. Schmidt (1990: 144) believes that, perhaps, it is possible for both children and adults to learn without trying when "task demands force attention on specific information". However, he suggests that incidental learning, i.e. picking up linguistic forms that are not important for the completion of a task seems unlikely for adults (Schmidt 1990: 149), but this could possibly be a consequence of the different task types utilized with younger and older learners. In typical instructed FLL settings, as Muñoz (2010: 46) points out, children do not have access to the "vast amount of input" that is required by their implicit learning mechanisms. According to her, these instructed settings are suitable only for adults and adolescent because of their higher level of cognitive maturity (Muñoz 2010: 46). This could explain, she continues, why older learners fare better in instructed settings.

The idea of social and affective factors being even more important than purely maturational or biological factors in language development and learning has also been proposed (Griffiths 2008: 39). As Bialystok and Hakuta (1999: 178) summarize, compared to adults, children may benefit from certain social factors facilitating language learning, since children are often provided with a "nurturing environment, simplified output, educational opportunities" that may influence learning in a positive way (Bialystok & Hakuta 1999: 178). Moreover, it is believed that children are less likely to experience fear or social comparison, which are common among adults and adolescents. Interestingly enough, one reason for children being so free to acquire

new linguistic matter might be that children are also less aware of how much, or rather, how little, they actually know of the target language (Griffiths 2008: 39). In addition to the language shock, culture shock tends to be more real for the adult learners as well (Griffiths 2008: 307). Children being freer of many of these affective and rather energy consuming variables, they can generally be seen as being in a more advantaged position in language learning compared to older students, at least with regards to social and affective factors.

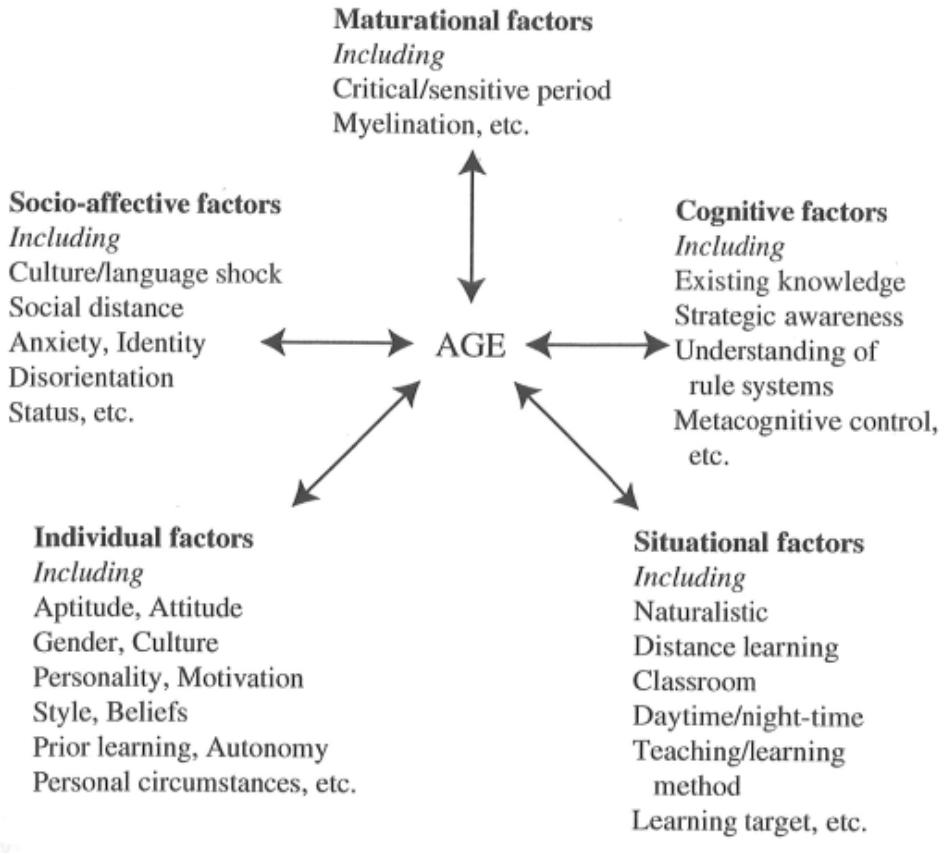


Figure 1. The interrelationship between age and other factors in language learning (Griffiths 2008: 41)

To sum up, older learners often have a more advanced set of cognitive skills and more metadata about learning, which can work in their advantage in FLL. However, there are plenty of reasons for why younger can be deemed to be better. In addition to the previously discussed critical and sensitive periods, younger learners seem to be in a more favourable position when it comes to different socio-affective factors as well as many situational and environmental factors.

2.3 Early FLL in Finland

Finnish schoolchildren will soon begin their foreign language studies two years earlier than before, now on the first grade instead of the third. Most of the first graders in Finland are seven years old as, according to the Basic Education Act (Perusopetuslaki 628/1999 §25), children should start compulsory schooling the year they turn seven. The Finnish National Agency for Education prepares The Finnish National Core Curriculum (NCC) that works as a nationwide guideline for organizing schooling (Finnish National Board of Education 2016). Within this framework, the education providers create their own local, municipality or institution-specific curricula.

It is stated in the Finnish NCC that all pupils must "receive instruction of mother tongue and at least two other languages" between grades three and six (Finnish National Board of Education 2016: 231). The first compulsory FL is referred to as A1 language, and the second compulsory language is called B1 language. Until now, A1 has typically been started in the third grade, whereas B1 begins in the sixth grade. Although the new language study regulation, which will make it possible for all children to start their AI language in the first grade, has not come into effect yet, some municipalities have already offered language teaching for first and second-graders. According to the NCC, this "instruction on the A syllabus may begin before the third grade", as long as pupils' age is taken into consideration (Finnish National Board of Education 2014: 136). There are also forms of early FLL that can be carried out before the A syllabus begins, and during which pupils learn the basics of a language through "songs, play, games and physical activities" (Finnish National Board of Education 2016: 136). This method is commonly referred to as *Language shower*. In this paper, we have used the term *language showering*, since one of the two teaching interventions included in the present study followed a design that fits the description in the NCC.

It is no surprise that the most popular foreign language choice in Finland is English. In 2017, a total of 89.9% of the third-graders in Finland chose English as their primary foreign language (Vipunen: Education Statistics Finland 2017). English is taught as a foreign language in over 100 countries, which also makes it the most popular language choice in the world (Crystal 2012: 5). In Finland, only few municipalities have the resources to offer languages other than English

as the first obligatory foreign language. Thus, in most cases, English is the first foreign language that pupils encounter in the school environment.

The early initiative in the Finnish school system as well as the language choices made by parents and pupils are closely related to the socio-political context of the society. The socio-political context decides the kinds of attitudes and views that, for example, parents and politicians will have related to age and FLL (Enever 2015: 17). As national policies direct language education, changes in policy should be based on context-appropriate research evidence. Enever (2015: 16) claims that decision-makers often draw FLL-related conclusions based on evidence gathered from various contexts, such as multilingual homes and immersion school environments, and that the positive results gained in some contexts may not be applicable to the ordinary comprehensive school environment. Muñoz (2010: 40) supports this view by claiming that, much too often, results from research made in a naturalistic or immersion setting affect the decisions concerning FLL in a formal environment, even though these two circumstances are not necessarily comparable. Furthermore, globalization is present in the marketplace and in people's everyday lives, so this can be used as an argument as to why languages, especially English, should be studied earlier and earlier. An early start makes it possible for an individual to attain fluency in a language by adulthood and, thus, be able to use that language to connect with people globally (Enever 2015: 17).

The question remains whether there really is enough evidence of the benefits of an early start to FLL. Long (2013: 262) argues that there is a lack of long-term evidence from these benefits in the more formal school environments, as the previous findings of the long-term benefits of an early start have been examining the phenomenon in the more immersion-like SL environments. According to Muñoz (2006: 59), SL contexts cannot be treated as equivalent to FL contexts as they differ in their language exposure in terms of quality and quantity. English is the foreign language that is the "most desired, needed, studied, and used by Finns" (Leppänen et al. 2011), but because of its dominance in the Finnish society it could almost be considered a second language to many Finns. It is then possible that the differences between English as an SL and FL contexts do not fully apply in Finland.

There are some studies from other countries that challenge the acclaimed benefits of an earlier start to language learning. One such study was conducted by Oller and Nagato (1974). They compared Japanese early and later foreign language learners (N=233) based on their

performance on cloze test scores. The early starters had studied English in grades 1–6, whereas the later starters had begun in grade 7. While the early beginners outperformed the later starters in grade 7, their advantage seemed to gradually disappear, and by the grade 11 no significant differences between the groups were found. While these results may seem disconcerting, the fact that the early and late starters were later merged into one group could have affected the results of this particular study. According to Long (2013: 262), the fact that the members of the two separate groups, the earlier and the later starters, had been mixed together might have caused the evening-out of the differences in language proficiency. If the groups had been kept separate, continuing to go on in their own pace, the differences between them would have been likely to still exist in grade 11.

Another common critique-worth feature in similar studies is their failure to include certain linguistic areas in the tests, all of which could distort the results of each group's actual language competence. Although the cloze test, in which one needs to fill in missing words in a written passage, has previously been considered a good indicator of one's language proficiency (Oller & Nagato 1974: 16), it should be obvious that the test is concerned only with the skills of reading, writing and written understanding. That was also the case in Oller and Nagato's study (1974); pupils' skills on other areas such as phonology, speaking or listening, were not included in the test. Therefore, because of these limitations, one should not consider the findings of Oller and Nagato, suggesting the non-existent long-term benefits of an early start, to be descriptive of all language skills. It would be interesting to know whether the results would have been the same if phonological skills had also been a part or the main focus of the test, as those skills tend to be the ones the early starters have had more time to train. The lack of phonological testing is, however, still very typical because testing one's phonological competence seems to be more challenging than testing the other linguistic skills (Long 2013: 262).

A more recent longitudinal study that also included the skill of listening was carried out by Jaekel, Schurig, Florian and Ritter (2017). They compared early starters (starting in grade 1) and later starters (starting in grade 3) of English (N=5,130) in Germany on their skills of listening and reading. While the level of competence between the two groups had been the same in grade 5, when compared in grade 7, the findings suggested the superiority of the later starters. Therefore, although the skill of listening was included in the test, the outcome did not seem to yield favourable results for the early starters in the long run. However, these results could be explained by the overall (little) amount of exposure to the target language for the early starters,

thus making them unable to really benefit from the extra two years of teaching they received. As Jaekel et al. (2017: 636) discuss in length in their paper, "to benefit from an early start, more exposure to the L2 in a meaningful context would be required".

Although we still lack the consensus in the field of research about whether the longer-term benefits of an early start to FLL really exist, the agenda for earlier FLL is still being strongly pushed forward in Finland and Europe as a whole. The eagerness of starting earlier FLL in schools does not, however, mean that the country is necessarily equipped enough for such changes to make the teaching beneficial for the young learners. In their report, Skinnari and Sjöberg (2018) summarize the state of early FLL in Finland. By using data gathered from multiple sources, they are able to illustrate how early FLL is organized in Finland at the moment. All of the municipalities in continental Finland and 7 out of 16 municipalities of the Åland islands were included in the report, i.e. 302 municipalities in total. In February 2018, local authorities from Finnish municipalities were asked to fill out an email questionnaire and to describe what kind of early foreign language education is offered in their area. Authorities from 154 municipalities answered the email questionnaire, and the answers show that 71 (46%) of them had offered earlier FLL, whereas 83 (54%) had not (Skinnari & Sjöberg 2018: 33). To have a better overall picture of earlier FLL in Finland, data was also gathered by conducting phone surveys and by going through local websites and looking for information on language programs. Based on this information, the researchers were able to conclude that 116 out of 302 municipalities (38.4%) had offered earlier A1 or B1 language education (Skinnari & Sjöberg 2018: 34). During the school year of 2017–2018, 113 municipalities had offered earlier A1 language teaching. A majority of these municipalities, 61 (54%), offered language teaching for second-graders, 34 (30.1%) for first graders and 18 (15.9%) for kindergarteners. English was taught before the third grade in 93 municipalities. These numbers, therefore, demonstrate the teachers' current lack of experience in early language teaching in Finland.

The change to earlier FLL brings about a number of issues to which language teachers will need to be equipped for. Ultimately, the change entails that school children will now be required to adapt to a new language and to a new sound system at a younger age, which, in terms of teaching, is not as simple as it may sounds. It needs to be understood that language teaching to a class of six or seven-year-olds is not equivalent to teaching children at the age of, say, nine. As the children entering the new language classes might not yet be literate, the teaching is likely to rely on oral communication. Children would thus start getting to know the language mainly

by listening and repeating, which is why skills in sound perception, pronunciation and other phonological areas will be at the center of language learning.

For the early start to FLL to be of any benefit, teachers would be required to have both the competence in and linguistic knowledge of a language, as well as the understanding of how young children acquire language most effectively. Skinnari and Sjöberg (2018: 24) report that 25% of the teachers who had already taken part in earlier FLL in Finland had worked cooperatively with another teacher in the classroom. Often a class teacher and a language teacher work as co-teachers, so both class teachers and language teachers are doing the earlier FLL teaching (Skinnari and Sjöberg 2018: 24). Skinnari and Sjöberg (2018: 55) report that teachers have generally called for further training to be ready to face these new circumstances. They emphasize that teachers have different needs in training, since language teachers might not have any previous experience in working with very young language learners, whereas kindergarten and elementary school teachers may have concerns about the linguistic side of teaching. Long (2013: 261) addresses this issue by posing the following question:

> Is kindergarten and elementary school teachers' command of the target language acceptable, or is the input their speech would provide likely to be impoverished and problematically non-native-like?

Long's worry is that a teacher, if not familiar enough with the target language, could be using the language in a way that does not meet the standard required of language teachers. In such a case, the teacher would be depriving the learners of the possibility to deal with the more accurate language matter, and therefore possibly cause some problems for the learners. What is *acceptable* or *required* is, however, hard to define. Furthermore, the idea of *native-likeness* can seem somewhat outdated as it is difficult to define and attain in today's world where English often has the status of a lingua franca. In the opinion of the authors of this paper, English teachers should have good communicative competence and intelligible pronunciation, however, the principle of native-likeness should not be a criterion for choosing appropriate teachers. Kindergarten and elementary school teachers are, however, not the only ones to overcome issues in the new circumstances, but the change relates to language teachers as well. According to Enever (2015: 23), language teachers do not usually have time to specialize in early foreign language teaching as the point of their training is to provide an overall competence for teaching learners of all possible ages, from preschool to adults. As a consequence, the specific skills for

working with little children will not be fully developed in the training period. Again, Long (2013: 261) pleads us to carefully consider the new situation (language) teachers are in:

> [A]re trained teachers and suitable materials available, or will it just be more of the same old drill and kill, made even more inappropriate for being served up to younger learners?

Here, Long is pointing to the fact that younger learners cannot be offered material or methods identical to the ones used with older learners. He is using the phrase *drill and kill* to describe how language classrooms have been guilty of employing unsuccessful methods that only cause learners to lose motivation in learning – a mistake he wishes could now be avoided by being mindful of the new, young learners' special needs and abilities.

In conclusion, as we have explored in this section, as the early FLL initiative is being pushed forward in Finland, the teachers of the young learners will need to be equipped for the new circumstances accordingly. In other words, both linguistic and pedagogical know-how will be necessary to make the learners benefit from the foreign language teaching so early on. Next, we will move on to the next chapter to explore the theme of phonetics and pronunciation.

3 PHONETICS AND PRONUNCIATION

Effective oral communication skills are a central part of everyday language use. Through speech, individuals express their personal identity as well as their membership to social communities (Seidlhofer 2001: 56). Pronunciation is an important part of speech, as pronunciation skills are so closely related to intelligibility, i.e. the ability to convey messages (Seidlhofer 2001: 56). When the speaker's intended message is understood by the listener, the utterance can be described as intelligible (Derwing & Munro 2015: 1). Due to the central role of pronunciation in language use, it can be argued that foreign language teaching should provide learners with opportunities to develop their intelligibility in the target language. There are numerous elements of speech that can affect intelligibility, but the concept of pronunciation and more specifically its phonetic side is the main focus of this thesis. In this chapter, first, some essential pronunciation-related terminology is presented. Secondly, the Finnish and English sound systems are introduced, and the two systems are compared. Finally, the importance of phonetic training is investigated.

3.1 Essential terminology

Derwing and Munro (2015: 2–3) define the term pronunciation as "the ways in which speakers use their articulatory apparatus to create speech". According to Seidlhofer (2001: 56), pronunciation refers to the "production and perception of the significant sounds of a particular language in order to achieve meaning in contexts of language use". The elements of pronunciation can be divided into segmentals and suprasegmentals. Segmentals include the individual consonant and vowel sounds, i.e. phonemes of a language, whereas suprasegmentals, such as word and sentence stress, rhythm and intonation, refer to the aspects of speech affecting larger units of sounds (Derwing & Munro 2015: 3). We believe that all aspects of pronunciation play an important role in effective oral production, but since the aim of this thesis was to study the production of separate English segmentals, the suprasegmental, prosodic features will not be discussed in this paper.

There are two main branches of speech study, phonetics and phonology, that investigate the phenomena of speech from different angles. Daniel (2011: 1) demonstrates the distinction between the two concepts. According to him, phonetics refers to the scientific description of

speech sounds and their acoustic properties. It is interested in the processes physiologically involved in the production of sound, and it investigates how speech sounds are produced and perceived. Ogden (2009: 1) defines phonetics as "the systematic study of the sounds of speech, which is physical and directly observable". Phonetics can be studied from a variety of angles. *Articulatory phonetics* studies how speech is created in the body, whereas *acoustic phonetics* is interested in the "physical properties" of speech sounds (Ogden 2009: 2). Another angle for the study of phonetics is perception, i.e. how speech signals are processed by the listener (Ogden 2009: 2). In phonology, however, the focus is on the phonetic realizations of speech sounds in actual communicative situations, as it attempts to define how the components of the abstract system of speech behave in actual speech (Daniel 2011: 1). Therefore, when we refer to *phonological skills*, we mean the general skills applied or needed in pronunciation, whereas the concept of *phonetic skills* is used more precisely to describe one's abilities to perceive, produce or manipulate individual sounds. In similar fashion, when we use the term phonetic awareness, we allude to being aware of and being able to apply the phonetic skills mentioned above.

In phonetic transcription, written phonetic symbols are used to create a visual representation of the sounds of speech (Ogden 2009: 20). The International Phonetic Alphabet (IPA) recognizes two major speech segments, consonants and vowels. The difference between consonants and vowels comes down to their differing production, since consonants are produced with constriction in the vocal tract, whereas the production of vowels occurs without constriction. Due to the differences in the articulation of consonants and vowels, the framework for their classification is different (Ogden 2009: 23). The IPA chart organizes consonants according to their manner and place of articulation, whereas vowels are categorized based on height, lip posture and the vowel's frontness or backness (Ogden 2009: 22, 59). Vowels are discussed in this section merely in comparison to consonants, because our experimental study focused on consonant production. In the consonant chart, the rows represent the manner of articulation and the columns organize sounds according to their place of articulation (see Table 1).

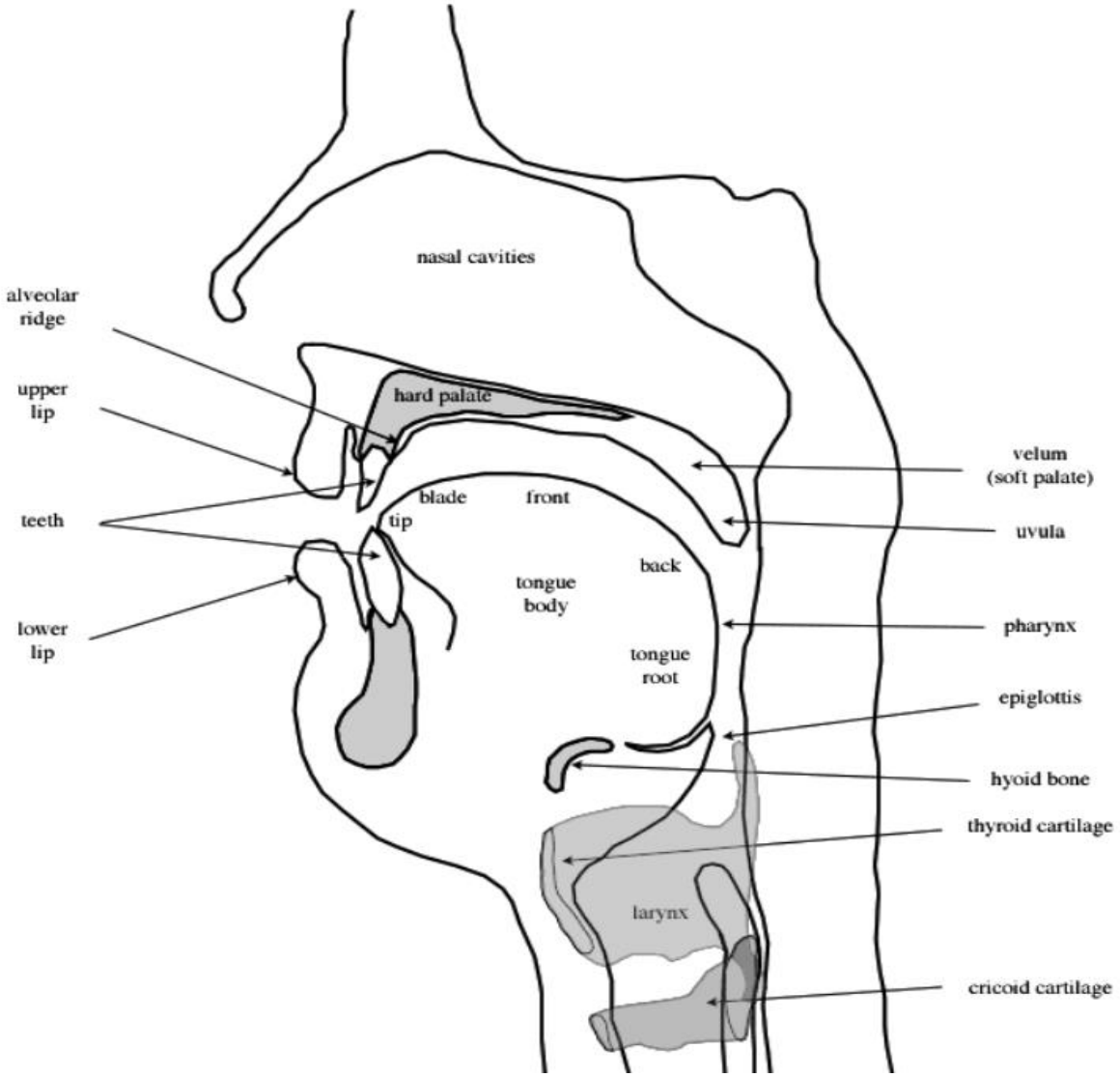


Figure 2. Illustration of the vocal tract and speech organs (Ogden 2009: 10)

Creating speech sounds is a complicated process that involves the articulatory organs, such as the lips, tongue, vocal folds, as well as the manipulation of airflow (see Figure 2) (Ogden 2009: 7). In articulatory phonetics, sounds can be described through these different articulatory features (Daniel 2011: 15–16), some of which we will discuss here. First, the source and direction of the air stream plays a crucial role in articulation and is seen for instance in air flowing out from the lungs while producing a sound. Air plays an important role also together with the position of the soft palate, that can be lowered or raised, determining whether sounds become oral, nasal or nasalized (Daniel 2011: 15–16). Oral airflow refers to sounds with air exiting only through the mouth, whereas nasal sounds are produced by airflow through the nose. Nasalized sounds include both oral and nasal airflow (Ogden 2009: 11). Another aspect of

articulation includes the vocal folds that could entail either closed, open or vibrating, resulting in either voiced or voiceless sounds (Daniel 2011: 15–16). Sounds accompanied by vibration of the vocal folds are called voiced sounds, whereas voiceless sounds do not include vibration (Ogden 2009: 9). Examples of voiced and voiceless sounds are, for instance, [z] and [s] respectively. Finally, we can organize consonant sounds based on their place and the manner of articulation. The place of articulation refers to the point(s) at which the closure or narrowing occurs when making a certain sound (Daniel 2011: 16). The manner of articulation then describes the type of this closure or narrowing, that is, which organs are involved in it (Daniel 2011: 16). In other words, the place of articulation describes "where in the vocal tract a sound is made" and the manner of articulation refers to the way a sound is produced (Ogden 2009: 12, 16). The International Phonetic Alphabet organizes consonant sounds in a chart depending on their respective manners and places of articulation (see Table 1).

Table 1. The International Phonetic Alphabet of consonants[1]

CONSONANTS (PULMONIC) © 2015 IPA

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

Parts of the vocal tract that are involved in producing consonant sounds are called articulators (Ogden 2009: 12–16). At least two articulators, normally a passive and active articulator, are needed to produce a consonant, and the names of these articulators are used to specify the place of articulation of a sound. Bilabial sounds, like /p, b, m/, involve both lips. Labiodentals, such as /f, v/, are created when the upper teeth are in contact with the lower lip. Dental forms, like /θ, ð/, are made with the tongue against the upper teeth. The ridge behind the upper teeth, the alveolar ridge, is included in [2]the making of alveolar sounds, like /t, n/. Postalveolar sounds,

[1] Retrieved from https://www.internationalphoneticassociation.org/sites/default/files/IPA_Kiel_2015.pdf

such as /ʃ, ʒ/ are created behind the alveolar ridge. /j/ is the only palatal sound in the English language, and it is made by raising the middle part of the tongue up to the roof of the mouth. When the back of the tongue is raised towards the soft palate, a velar sound like /k, g/ is made. /h/ is a glottal sound, created between the vocal folds in the larynx (Ogden 2009: 12–16).

The manner of producing consonant sounds differs based on consonant type. Different types of consonants include plosives, affricates, nasals, trills, laterals, fricatives and approximants (Daniel 2011: 18–19). Plosives or stops like /p b t d k g ʔ/ are produced when there is an explosion-like release of air from behind the articulatory organs. To make a plosive sound, there must be a complete closure of two articulators in the vocal tract (Ogden 2009: 16). Fricatives like /f v s z ð ʃ θ ʒ h/ occur when the "air stream forces its way through a narrow passage" in the articulatory organs (Daniel 2011: 18–19). The fricatives /s z ʃ ʒ/ are sometimes grouped together, since they are all sibilants, i.e. fricative sounds that include a hissing sound (Encyclopædia Britannica 2016). Affricates can be described as "plosives which are released into fricatives" (Ogden 2009: 17). They are produced by gradually letting the air come from behind the organs which creates friction, e.g. in /tʃ dʒ/ (Daniel 2011: 18–19). Nasal sounds like /m n ŋ/ are produced when the soft palate is lowered and the "air escapes through the nose". Trills, like /r ʀ/, or sometimes rolls or taps, are sounds produced by the tongue hitting against the alveolar ridge, and in some cases the uvula tapping the back of the tongue. The laterals, such as /l/, are sounds that are "produced with the partial closure of the center of the tongue against the alveolar ridge". Finally, approximants, like /w j ɹ/, are sounds that fall between consonants and vowels, because although they are vocalic sounds, they still have consonantal features and functions (Daniel 2011: 18–19).

In addition to articulatory features, sounds may have *secondary articulations*, like velarization, labialization, palatalization or nasalization, depending on which parts of the mouth (e.g. soft palate, lips, nasal cavity) are involved in the production of the sound (Daniel 2011: 17). For instance, in making the lateral /l/ sound, there are primary and secondary articulations (Ogden 2009: 85). A palatalized version of a lateral sound is called clear and a velarized version of the sound is called dark. Syllable-final laterals, like in the word *feel*, are more velarized than syllable-initial ones, i.e. the tongue moves to the back of the mouth.

In speech analysis, to distinguish between different units, there are certain conventions that need to be followed. The main units of speech analysis are letters, phonemes and sounds. In

this thesis, the focus is on phonemes, but it is important to acknowledge the characteristics of the other units, as well. In the description of orthography, the letters of speech are enclosed between angled brackets, e.g. <p> (Ogden 2009: 5), and phonemes and sounds also have their own universal markings. According to Ogden (2009: 4), "phoneme is the smallest unit of sound which can differentiate one word from another". In other words, phonemes are "linguistically meaningful items that create lexical items" (Ogden 2009: 4). They can be described as phonological units, as opposed to phonetic units, because they are abstract concepts. Phonemes are written between slashes, e.g. /p/, whereas actual realizations of speech sounds are written between square brackets, e.g. [p]. Speech sounds written between square brackets have a physical dimension, which means that they can also be "described in acoustic, auditory or articulatory terms" (Ogden 2009: 4.). The same phoneme can be pronounced in different ways, i.e. it can have allophonic variations, which is why relying merely on the phonological description of sounds can, at times, be inadequate. To summarize, the three different units of speech analysis are letter, e.g. <p>, phoneme, e.g. /p/ and sound, e.g. [p]. The present study examined pronunciation on the *phoneme* level, i.e. considering production of phonological units as opposed to the more specific realizations of sounds or their allophones. In this paper, the term *sounds*, as in the research questions of this study, is used interchangeably with the word *phonemes.*

3.2 English and Finnish consonantal systems

In this section, we will present the characteristics of the Finnish and English consonantal systems. After the general presentation, the two sound systems are compared to each other. The contrastive analysis allows us to discuss the difficulties that Finnish students of English face when it comes to learning English consonant sounds.

3.2.1 The Finnish consonantal system

The description of the Finnish sound system presented below is based on the work by Suomi, Toivanen and Ylitalo (2008). As is the case with all languages, there are as many Finnish varieties as there are Finnish speakers. Consequently, to narrow down the focus in the analysis, Standard Spoken Finnish (SSF), was chosen as the variety to work as a basis for the discussion in Suomi et al. (2008). SSF is a more formal variety of Finnish used in, for instance, education. For the purposes of the present study, only the consonant system of Finnish is discussed in this

chapter. While the Finnish vowel structure is rather stable, the consonant system is more complex, which makes it difficult to state the exact number of consonant phonemes (Suomi et al. 2008: 22, 24). There is a great deal of variation in the consonant inventories between different varieties of the language, which is why Suomi et al. group the consonants in five different groups according to their occurrence (see Figure 3). The groups were first presented by Karlsson (1983). The groups are based on a distinction between frequent and less frequent consonants in the Finnish language. Group 1, the inner circle, comprises of the most common consonants, whereas the consonants in Group 5 appear mostly in loan words and not all Finns use them. The total number of possible consonant sounds is 17, when all of the phonemes in each group are added together.

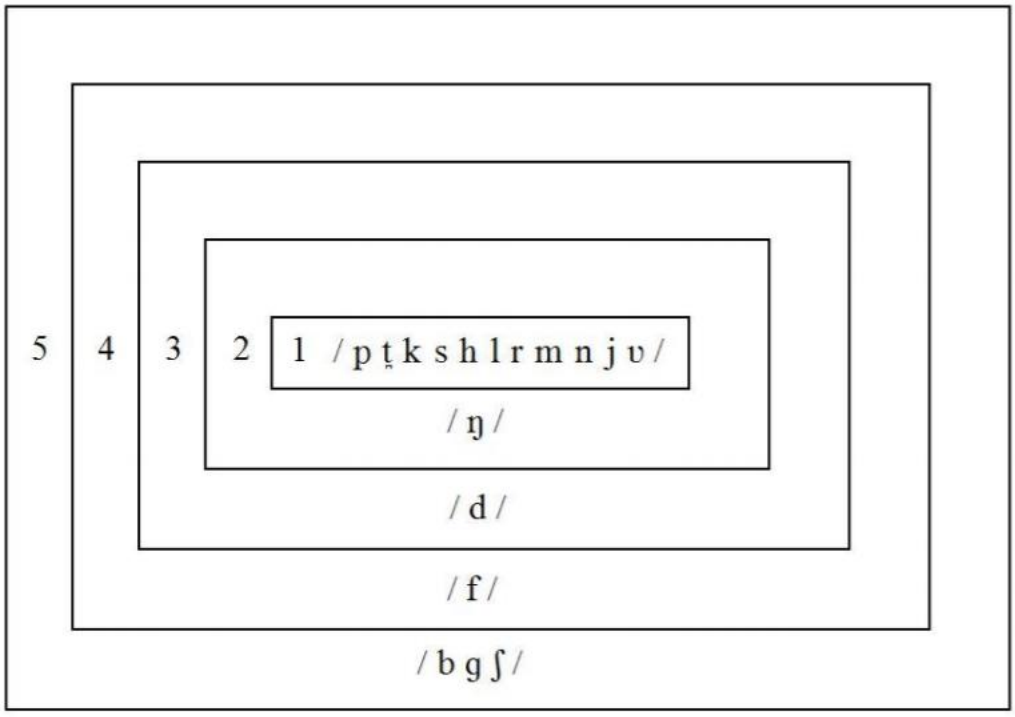


Figure 3. The five groups of Finnish consonants by Suomi et al. (2008: 25)

Group 1

There are at least eleven consonants belonging to Group 1 that can be found in nearly all native Finnish speakers' phoneme registers (Suomi et al. 2008: 26). That is, /p t k s h m n l r ʋ j/ are familiar to practically all Finnish language users. The plosives /p t k/ are unaspirated and voiceless with a weak burst of air. However, partly or fully voiced allophones can be encountered in careless speech. (Suomi et al. 2008: 26–27). The fricative /s/ is the most

common, and often the only sibilant sound in most varieties of Finnish, allowing for a great deal of variation in its phonetic realization. The most common allophone of this sound is between the IPA sounds /s/ and /ʃ/, since it is less sharp than the IPA /s/ (Suomi et al. 2008: 27). Because it is the only sibilant in many varieties, the realization of /s/ can vary tremendously without fear of misunderstandings (Suomi et al. 2008: 27). The fricative or, in some cases, glottal continuant /h/ is a common Finnish sound that occurs in a variety of word positions (Suomi et al. 2008: 27). In English, /h/ can mostly be found in syllable-initial positions, whereas, in contrast, the Finnish language allows for more variation in its occurrence. Depending on the placement of /h/, it can have at least four different phonetic realizations that are categorized as glottal continuants or oral fricatives (Suomi et al. 2008: 28). The rhotic /r/ can have at least two different tap or trill allophones, as well as an alveolar fricative allophone, which appears after /s/ (e.g. *Israel*). The central semivowels /ʋ/ and /j/ only occur in the syllable onset position, i.e. not in the middle of a syllable. There is an allophone [w] of /ʋ/, which occurs after diphthongs ending in /u/, so *sauva* becomes [sauwa]. Unlike in English, /w/ does not appear in word-initial positions. In Finnish, there is no difference between the pronunciation of the graphemes /v/ and /w/ (Suomi et al. 2008: 142).

Group 2

The nasal sound /ŋ/ belongs to Group 2, so Suomi et al. (2008: 31) consider its occurrence slightly more unlikely than the sounds in Group 1. Most Finnish speakers use the consonant /ŋ/ of Group 2 in their speech and are able to, for example, pronounce the sound in its long form, as in the word *sangen* ([saŋŋen]), but those who do not, substitute it with [saŋken] (Suomi et al. 2008: 31–32).

Group 3

The Finnish /d/ found in Group 3 is not a plosive as the IPA chart would suggest, since it has the properties of an apical alveolar (Suomi et al. 2008: 33), which means that it is produced with the top of the tongue touching the alveolar ridge. The /d/ sound occurs only word-internally in indigenous vocabulary (Karlsson 1983: 57), i.e. not at the beginning of words. Karlsson (1983: 58) notes that /d/ is often absent from many Finnish dialects, and that Finns have the tendency to attempt to replace the sound with an approximate phoneme, or to completely leave it out. However, he adds that speakers of the standard variety are able to produce the sound without difficulty. Before, it was often replaced with /t/ in loanwords (*tilli* comes from the

Swedish *dill)*, but nowadays it is more prevalent in the Finnish sound system, however, often deleted in /hd/ sequences (*kahden* can become *kahen)* (Suomi et al. 2008: 34).

Group 4

Similarly to /d/, defective patterns can also be detected with the phoneme /f/ found in Group 4. For instance, when Swedish loanwords were adopted into Finnish the /f/ in the original word was replaced with another phoneme, so the loan words in which /f/ is conserved are quite recent. In word-initial positions, it used to be replaced with /ʋ/ (*fara* became *vaara*) and in word-internal positions with /hʋ/ (*kaffe* became *kahvi*) (Suomi et al. 2008: 35). In most dialects, these phenomena still exist.

Group 5

The phonemes /b g ʃ/ in Group 5 were integrated into the Finnish sound system via recent loanwords, and they belong to only some speakers' inventory, depending on the context (Suomi et al. 2008: 35). There is, however, a discrepancy in the way they are realized. For instance, depending on the context, register and dialect, minimal pairs like *pussi* and *bussi* (*bag* and *bus*) can be encountered. In other varieties there is no distinction between voiced and voiceless plosives (Suomi et al. 2008: 35–36). Studying foreign languages that have the same voiced plosives in their systems can, however, increase the possibility of using the same phonemes in Finnish. In addition, factors such as higher level of formal education, young age, speaking slowly in a formal register and living in an urban area all make it more likely for a speaker to have the phonemes /b g ʃ/, as well as /f/ in his or her repertoire (Suomi et al. 2008: 36).

3.2.2 The English consonantal system

It is not possible to discuss English as one language nor the English phoneme system as one uniform entity. In English, there is great variation between dialects and different Englishes, because people from different cultural backgrounds and geographical locations speak the language in their own way. While we recognize the diversity of linguistic varieties, for practical reasons, the English consonant sounds will be discussed using Received Pronunciation (RP) as a reference. RP refers to the rather formal British accent traditionally used by newsreaders. This accent is often chosen as the basis for pronunciation teaching, because it has been studied and described extensively (Roach 2009:3–4), and it has also been the traditional variety in the

Finnish FL classrooms both in the form of textbooks and pronunciation teaching (Tergujeff 2010: 52-53).

Plosives

The phonetic inventory of English plosives is very rich and complex (Ogden 2009: 96). Usually two sets of plosives are recognized, voiced and voiceless, which, according to Ogden (2009: 99) does not give credit to the complexity of the articulatory process involving voicing, closure and release. The traditional view is that English has three voiceless plosives, /p t k/ and three voiced plosives, /b d g/. However, voiced plosives can be further divided into two subcategories, fully voiced and partially voiced plosives. In addition, voiceless plosives can be categorized as aspirated, unaspirated or preaspirated. These consonant sounds affect the length of preceding vowels, and vowels before voiced plosives tend to be longer than those preceding voiceless plosives, e.g. in the words *lock* and *log* (Ogden 2009: 99). Voicing itself is also context-dependent and, for instance, word-final /b d g/ are often only partially voiced. There is also a phenomenon of glottal stops in English. However, glottal stops cannot be categorized as phonemes, because they do not distinguish words from each other.

The place of articulation of plosives depends strongly on the context because plosive sounds adapt to the place of articulation of the following sound (Ogden 2009: 106). Because of this variation in the place of articulation due to processes of assimilation, English plosives can be described as either labial, coronal or dorsal. However, in most cases, the more specific terms bilabial, alveolar and velar can be used. The two bilabial plosives are the voiceless bilabial plosive /p/ and the voiced bilabial plosive /b/, as in the words *bit* and *pit*. The English coronal plosives, which are made with the tongue tip or the tongue blade, include dental, alveolar and postalveolar sounds. Dental plosives occur before the sounds /θ/ and /ð/, like in the word *width* or *breadth.* There are two alveolar plosives, the voiceless /t/ and the voiced /d/. Postalveolar plosives are a part of the affricates /tʃ/ and /dʒ/. There are two velar plosives, the voiceless velar plosive /k/ and the voiced velar plosive /g/ (Ogden 2009: 108).

Fricatives

From the point of view of manner of articulation, fricatives form the largest group of English phonemes. English has nine fricative sounds, and they can be presented as four voiceless-voiced phoneme pairs, /f/ and /v/, /θ/ and /ð/, /s/ and /z/, /ʃ/ and /ʒ/. In addition, there is one glottal fricative /h/. Fricatives are produced by creating friction in the vocal tract. Two articulators are

held apart but close enough that the air flowing through becomes turbulent. Alternatively, the air can be directed towards a surface like the back of the teeth, which makes the air turbulent (Ogden 2009: 118).

Categorized by place of articulation, there are labiodental, dental, alveolar, postalveolar and glottal fricatives. In the case of /f/ and /v/, air is released between the upper teeth and the lower lip. For many speakers, the dental sounds /θ/ and /ð/ are interdental, which means that the tongue is between the upper and lower teeth (Ogden 2009: 127). The phonemes /s/ and /z/ are alveolar fricatives. The name suggests that the air is hitting the alveolar ridge, thus creating turbulence. /ʃ/ and /ʒ/ are created with friction further back in the mouth, which gives them the name postalveolar. /ʒ/ cannot be seen in word-initial nor word-final positions in native English words. The glottal fricative /h/ does not occur in all varieties and all contexts of English. The quality of the sound depends on the surrounding vocalic sounds, and it can even be dropped in unstressed syllables as well as in word-initial positions (Ogden 2009: 130).

Affricates

There are two distinctive affricate sounds in English, /tʃ dʒ/. These two affricates, respectively, function as one phonological unit and can be found both word-initially and finally. Affricates are created by combining a plosive and a fricative release. In the case of /tʃ/, the plosive /t/ is followed immediately by the fricative /ʃ/. Ogden (2009: 110) illustrates the way the plosive and fricative sounds perform as one uniform affricate sound by giving the example utterances “to buy chews” and “to bite shoes”. The subtle differences in the production of these two utterances reveal the distinction between the combination /t/ + /ʃ/ and the affricate /tʃ/ (Ogden 2009: 110).

Nasals

The three English nasals /m/, /n/ and /ŋ/ are all voiced. The airflow goes through the nasal cavity when these sounds are produced, and there must be a complete closure in some part of the vocal tract. Nasals can be classified as stops, since what defines a stop is a complete closure in the vocal tract. The phonemes /m/ and /n/ can be used either word-initially or finally, but /ŋ/ occurs only in word-final position. The place of articulation of /m/ is usually bilabial, but labiodental allophones occur in words like *emphasis* (Ogden 2009: 144). The phoneme /n/ is alveolar, i.e. the tongue is in contact with the alveolar ridge. The occurrence of the velar nasal /ŋ/ is rather limited, since it must always be preceded by a vowel. In addition, the possible vowel + /ŋ/

combinations are limited, e.g. in the words *sing, sang, song, sung* (Ogden 2009: 145). It can only be preceded by the lax vowels /ɪ ɛ æ ʌ ʊ/ (Yavas 2006: 68).

Approximants

In some cases, the distinction between vowels and consonants is not as clear as it may seem. The English approximants /r/, /l/, /j/, /w/ can be described as vocalic sounds that function as consonants (Ogden 2009: 78). Approximants and vowels share the same articulative processes, since both are created when two articulators approach each other without generating friction noise. Simultaneously, the velum is raised, which seals off the nasal cavities. There are two glides, /j w/, and two liquids, /l r/. The glide /j/ is very similar to the vowel /i/, and it is produced by bringing the tongue body up to the hard palate (Ogden 2009: 79). The velum blocks the nasal cavities and the vocal folds are vibrating. When the labio-velar glide /w/ is produced, there is a double articulation, at the lips and at the back of the mouth. The back of the tongue is brought up to the soft palate, the lips are rounded, the nasal cavities are blocked, and the vocal folds vibrate (Ogden 2009: 81).

In English, laterals do not have friction, which is why they are considered approximants. There are several ways to produce a lateral sound, but the orthographical form is always <l>. When uttering, for instance, the word *leaf*, the speaker's tongue tip or tongue blade touches the alveolar ridge, creating a complete closure between the two articulators (Ogden 2009: 83). The sound /r/ is an interesting consonant, since it has many different realizations depending on the context and the speaker's accent. The term *rhotic* is used to represent the different realizations of the phonemes corresponding to the letter <r> (Ogden 2009: 89). The English /r/ sound can be described as retroflex, since the tongue curls back during its production. The term post-alveolar applies here as well, since the tongue is further back in the mouth than with alveolar sounds (Roach 2009: 50).

3.2.3 Contrastive analysis of Finnish and English consonants

As one might conclude based on the phonetic descriptions above, the English and the Finnish sound systems are quite different, and as a Finno-Ugric language, Finnish differs in many ways from Germanic languages, such as English. In this section, we will discuss some of the main differences between the two sound systems, and for the purposes of the present study, we will concentrate on consonants rather than vowels or suprasegmental features. Through examining

the contrasting systems, we also wish to explain some of the difficulties Finnish speaking learners of English typically encounter. The difficulties encountered in learning to pronounce the sounds of a foreign language can be caused by problems in perception as well as in production. If the phonetic system is mostly tuned to perceive subtle differences the native language, it can ignore sound contrasts in other languages. Furthermore, producing new sounds evidently requires learning new motor skills. See section 2.1 for discussion on the connection between phonetic mapping and pronunciation.

The English language lacks a "straightforward correspondence" between its pronunciation and writing systems (Derwing & Munro 2015: 14). This means that, in English, there are many inconsistencies between spelling and pronunciation. The Finnish sound system, however, has a strong grapheme-phoneme correlation, phonemic distinctions being visible in the orthography for both vowels and consonants (Suomi et al. 2008: 36, 141). In other words, Finnish speakers are used to one letter standing for one sound only, and the sound of the letter being most of the time the same no matter the context of the letter. As Derwing and Munro (2015: 15) point out, for someone used to such transparent letter-sound relationships and "nearly phonetic writing systems", like Spanish or Finnish, learning to read and spell in English can turn out to be a real challenge.

As has already been shown, English and Finnish differ in their number of consonants in the language, which can also result in difficulties for Finnish learners of English. The English language has nearly twice as many (24) consonant phonemes compared to the Finnish language, which means there are plenty of new sounds for Finnish students to learn. According to cross-linguistic studies, the consonant sounds that Finnish-speaking learners of English struggle the most with are sibilants, affricates and dental fricatives (Tergujeff 2013: 22). All of these sound categories represent ways of pronunciation that are mainly foreign to Finnish speakers, since there is only one sibilant sound in Finnish, and no affricates nor dental fricatives. Morris-Wilson (1992: 68), who discusses interference of the Finnish articulatory system on the production of English consonants, explains that while the English sibilant /s/ is produced further forward in the mouth, and /ʃ/ is produced at the back of the mouth, the Finnish /s/ typically falls between these two sounds. Finns often produce /ʃ/ too forward in the mouth and do not round their lips enough. Morris-Wilson (1992: 75) claims that for /s/ and /ʃ/ Finns can find the correct manner of articulation but the incorrect place. Thus, to distinguish these two sibilants, Finns need to focus on finding the correct places of articulation for these sibilants. What is more, it is

sometimes difficult for Finns to distinguish /s/ and /z/, and /ʃ/ and /ʒ/, since finding the right strength of articulation, voicing and friction noise needed for each phoneme takes practice (Morris-Wilson 1992: 71). Morris-Wilson suggests that Finns should remember that /ʃ/ and /s/ are fortis sounds, i.e. they require more strength than the lenis sounds /z/ and /ʒ/. Compared to the Finnish /s/, the English /s/ and /z/ are produced at the front of the mouth whereas /ʃ/ and /ʒ/ are created at the back.

As for the dental (and labiodental) fricatives /θ ð f v/, producing the right kind of friction seems to be the greatest obstacle for Finns. Finnish speakers usually produce a frictionless /v/ sound, resembling the frictionless Finnish /ʋ/, which might lead to misunderstandings as English speakers might confuse this sound with the approximant /w/ (Morris-Wilson 1992: 59-60). He adds that since the Finnish /ʋ/ and /w/ are sometimes treated interchangeably (e.g. 'vappu' sometimes becomes 'wappu'), it can be difficult for Finns to acknowledge that the English fricative /v/ is quite far apart from the approximant /w/. To produce /v/, the upper front teeth must be pressed against the lower lip to create friction, whereas to create the /w/ sound the lips must be rounded. Morris-Wilson (1992: 57) describes two aspects that distinguish /f/ and /v/. The /f/ sound is a fortis sound, i.e. needs more strength to be articulated, whereas /v/ is a lenis that requires less strength. Thus, the friction noise is stronger for /f/. The other factor to consider is the duration of the preceding vowel sound, which is shorter before the fortis sound /f/. Thus, a Finnish learner of English needs to know how to apply the right amount of friction noise and adjust the duration of a preceding vowel in order to distinguish these two sounds.

The dental sounds /θ ð/ may easily be confused with /t/ and /d/, respectively, since they are the nearest familiar sounds for Finnish speakers. The resulting sounds are incorrect, because the important friction is ignored by Finns (Morris-Wilson 1992: 62–63). Morris-Wilson suggests that Finns usually find the right place of articulation for /θ/, but choose the wrong manner of articulation, which results in /d/. He adds that when it comes to /ð/, Finns have even more difficulties, since they tend to produce an alveolar stop instead of a dental fricative, so both the place and manner are incorrect. In addition to finding the right manner and place of articulation, voicing is an important factor in distinguishing these phonemes. If the voicing is not in order, the sounds can be confused with each other. The phoneme /ð/ can be, depending on the word context, voiced, partly devoiced or fully devoiced, so a Finnish learner must know how to apply the right voicing and friction to create this sound. The phoneme /θ/, on the other hand, is always voiceless (Morris-Wilson 1992: 61). The difficulty in producing these sounds is not only a

problem for Finns, since these interdental fricatives are nonexistent in most of the languages in the world, and consequently, many speakers substitute them with similar sounds from their L1 (Yavas 2006: 177). However, Brown (1988: 600) claims that the *functional load*[3] of the phoneme distinction /d ð/ might not be so significant, i.e. there are not many important distinctions made with these two sounds in English. He acknowledges that there are several minimal pairs containing these sounds but underlines that the two phonemes often occur in different contexts. The phoneme /ð/ occurs in "grammatical function words" such as *though* and *then*, whereas the occurrence of /d/ is more widespread. Thus, it is improbable that mixing the two sounds would cause misunderstandings, because the sounds are used in different contexts (Brown 1988: 600). On the other hand, short functional grammar words are rather common in English, so it might be useful for a Finnish learner of English to focus on learning them.

What is more, distinguishing the fricative phonemes /f/ and /θ/ can be problematic for Finnish speakers. For instance, the fricative noises in the words *fin* and *thin* may sound nearly identical (Yavas 2006: 107). When comparing the spectrogram images made in the speech analysis program PRAAT, the words *thin* and *fin* indeed appear very similar, but there are some minor contrasting features. "The intensity range is lower" in /f/ than in /θ/ (Yavas 2006: 107), i.e. the spectrogram image in the middle seems darker for /θ/. Moreover, the labiodental sound /f/ has a longer duration than the interdental /θ/ (Yavas 2006: 107) (see Figure 4). For comparison, consider the differences between /s/ and /t/, a sibilant and a plosive, where the contrast much more evident (see Figure 5). These images demonstrate well why /θ/ and /f/ can be so difficult to tell apart, at least in isolation without a word context. Since the acoustic difference between /θ/ and /f/ is so fine, the contrast between the two sounds is consequently absent in many languages (Yavas 2006: 107).

[3] Discussed more on page 44.

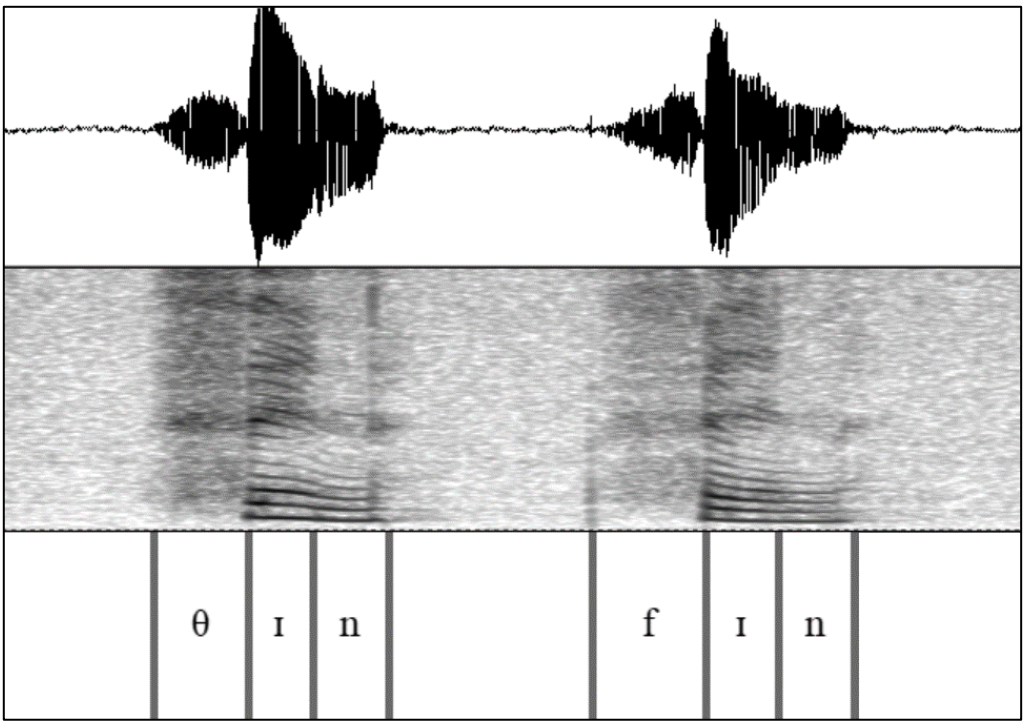


Figure 4. Thin – fin pronounced by female native Finnish-speaker

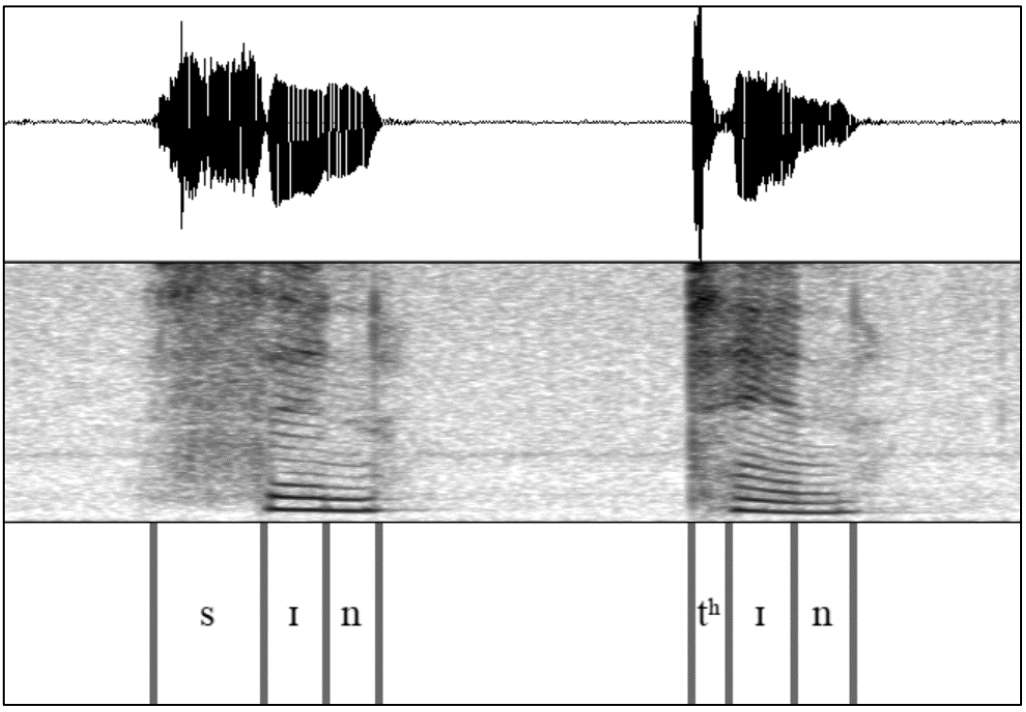


Figure 5. Sin – tin pronounced by female native Finnish-speaker

The affricates /tʃ/ and /dʒ/, which can be described as combinations of a plosive and a fricative, can be difficult to produce for Finnish learners, since they are nonexistent in Finnish. Typically, since Finns have problems in finding the correct place of articulation for these sounds, they are

pronounced too far forward in the mouth and sound more like [ts] and [dz] (Morris-Wilson 1992). This may lead to misunderstandings, since there are minimal pairs like *watch*/*what's* and *hedge/heads* (Morris-Wilson 1992: 99). The correct production of /ʃ/ and /ʒ/ is, of course, crucial here. In addition to the challenging place of articulation, the duration of these sounds may also contribute to the difficulty in their production, Finns sometimes prolonging the sounds to an unnecessary extent (Morris-Wilson 1992: 99).

Finally, Finnish speakers are usually able to perform well in the production of most English plosives, that is, find the correct places of articulation for them (Morris-Wilson 1992: 90). Nevertheless, there are some minor differences in the Finnish way of pronouncing plosives. In Finnish, /t/ usually receives a dental articulation, whereas in RP it is more alveolar, i.e. more towards the back of the mouth. The English /p t k/ phonemes are also clearly stronger than the Finnish counterparts, and because of the force of articulation, they are followed by a puff of air and become aspirated. As aspiration is not needed in Finnish to tell voiceless and voiced sounds apart, is it usually ignored also in the pronouncing of the English plosives. This absence of aspiration can, however, lead to misunderstandings, since English speakers are not used to differentiating plosives only based on their voicing, but need the aspiration to hear the difference (Morris-Wilson 1992: 90). Learning to aspirate voiceless plosives can be crucial for intelligibility, since on Brown's (1988: 604) list of the most important minimal pairs, the sounds /p b/ are at the top. These sounds are often conflated by learners of English and are of maximal importance in communication.

A quite recent study by Lintunen (2014) investigated the English sound production skills of Finnish university students. The results support previous knowledge of the difficulties that Finns face in English pronunciation. Lintunen tested Finnish university-level language students' perceptions on their pronunciation of English sounds, as well as their actual pronunciation skills of these sounds (Lintunen 2014: 7). The students (N=69), whose L1 was Finnish, were asked to do a self-assessment on sounds that they found most challenging in English, after which they participated in a pronunciation test that consisted of the reading out loud of a short text and a word list. Lintunen (2014: 5) found that most difficulties in pronunciation among the Finnish students had to do with consonants. The opposition between /v/ and /w/ was found to be the most difficult one. Sibilants, with the exception of /s/, affricates and dental fricatives were also deemed typically challenging. The list is not surprising, as these

phoneme classes line up with the findings of Tergujeff (2013) and Morris-Wilson (1992) described above.

In sum, the list of consonant sounds in the English language is rather extensive compared to Finnish. What is more, the sound-letter correspondence in English is not clear, and many different combinations of letters can lead to the same sound. Thus, a Finnish-speaking learner of English has to learn many new consonant sounds and learn to produce them in the right context. There are challenges to overcome in pronunciation, and finding the correct place and manner of articulation as well as creating the correct voicing for different sounds can be difficult. Finns appear to struggle the most with dental fricatives, different sibilant sounds and, consequently, with affricate sounds. In training, it might be beneficial to rank the importance and functional load of different phoneme contrasts (like in Brown 1988) and focus on those that are the most significant in communication.

3.3 Teaching phonetics and pronunciation

This chapter presents an overview of the rationale for teaching phonetics and pronunciation. However, as the goal is to discuss the main theoretical issues related to learning pronunciation, we will not consider, for instance, individual teaching methods or techniques. In the first section, the discussion will focus on intelligibility and the goals that direct pronunciation teaching. The next section focuses on the role that the themes of perception (versus production), awareness and consciousness have in pronunciation teaching and learning. Finally, the topic will be considered from the point of view of Finnish-speaking learners of English.

3.3.1 Issues related to teaching phonetics and pronunciation

Comprehensible pronunciation is one of the factors that most affect intelligibility and the ability to convey messages in a foreign language (Seidlhofer 2001: 56), which is why it is an important part of language learning. The matter is crucial, since “without intelligible pronunciation there can be no communication at all” (Szpyra-Kozłowska 2015: 69). As is the focus of this thesis, consonant phonemes as a sub-skill of pronunciation is the main issue discussed here. As has already been concluded in the discussion of critical and sensitive periods in this paper, phonetics seems to be a unique part of language competence because of its biological and age-related

elements. The distinct, biology-related nature of phonology does not, however, mean that phonetic aspects or pronunciation could or should not be taught in schools.

Pronunciation is also mentioned in the Finnish NCC (Finnish National Board of Education 2016: 238). It lists practicing and observing pronunciation and its prosodic elements, such as word and sentence stress, speech rhythm and intonation as one of the goals for English class in primary school grades three to six, i.e. with ten to twelve-year-old children (Finnish National Board of Education 2016: 238). Each phonological subskill is, indeed, useful for successful communication, and even the phoneme level skills can serve as a great contributor to spoken interaction. Seidlhofer (2001: 59) breaks this down by underlining the importance of being able to sort out the distinctive phonemes in a language, because they can change the meaning of a word.

Although age has been the focus of our discussion so far, we acknowledge that there are also other important aspects to be considered when it comes to teaching or learning phonetics. We have already discussed how the process of language learning can be influenced by various factors, and learning pronunciation is no exception in that respect. Derwing and Munro (2015: 30–49) distinguish several elements that affect phonetic learning. In addition to age, language experience and other personal factors like motivation and aptitude, they point out that there are also instructional factors that play a part in the learning process. This should be comforting news from a teacher's point of view, as whereas the first mentioned factors are more inherent or personal, instructional factors, like phonetic instruction, are the ones through which a teacher can actually have an influence on the successfulness a student's learning. By investigating the processes of phonetic learning, educators should be able to develop suitable teaching strategies for their learners (Derwing & Munro 2015: 30). We will next discuss some of the main issues that need to be considered in pronunciation teaching.

Although it would be easy to assume that any kind of pronunciation training is beneficial for foreign language learners, the underlying ideologies in teaching can play a great role in achieving the desired results. Levis (2005: 370) compares two ideological backgrounds of pronunciation teaching. He suggests that there are two conflicting principles, the *nativeness principle* and the *intelligibility principle* that might steer pronunciation teaching in a certain direction. The former appeared to be popular before the 1960s, whereas the latter seems to be a more modern view of pronunciation teaching. Levis (2005: 370) goes on to explain that

according to the intelligibility principle, it is enough to be understandable, and that a foreign-sounding accent may not be a hindrance in achieving that goal. Instead of focusing on accent reduction, instruction should be directed towards the features that affect intelligibility the most (Levis 2005: 370). The intelligibility principle can be applied in the Finnish context, because the NCC does not give strict instructions on the matter and pronunciation in foreign language teaching is not discussed broadly in the guidelines. Observing and practicing pronunciation and prosodic features of a language are listed as the main goals of pronunciation teaching (Finnish National Board of Education 2016: 238) but sounding like a native speaker is not among the goals. Levis (2005: 370) states that the declining popularity of the nativeness principle can be seen as a result of research in the biology of language learning (see eg. Lenneberg 1967, Scovel 1995). Lenneberg claimed that attaining a native-like accent became increasingly difficult with age. These findings would suggest that the nativeness principle possibly sets unattainable and unrealistic goals for language learners. The authors of the paper at hand agree with Munro and Derwing (2011: 317), who state that if the central goal in pronunciation teaching is as unrealistic as attaining a native-like pronunciation, it can reduce motivation on learning pronunciation. In addition, each learner has different personal goals regarding the level of language skills he or she is aiming at, so setting specific, universal goals can be challenging (Szpyra-Kozłowska 2015: 70) and does not serve a purpose from an individual's point of view. What is more, Seidlhofer (2001: 60) states that native varieties can be used as models, but learners should be allowed to shape and develop their own ways of pronunciation.

Issues in pronunciation and, therefore, in transferring messages are usually a sum of various problems. Cases of "communication breakdown" can rarely be linked to one single phonetic inaccuracy, but the result of many semantical, grammatical or pronunciation-related errors (Szpyra-Kozłowska 2015: 70). Furthermore, intelligibility is closely linked to the concept of *functional load* (Munro & Derwing 2006: 522). Functional load is a term that can be used to describe the weight or relevance of distinct sounds for comprehensibility in communication. Mispronouncing sounds that have a high functional load is likely to create more problems for one's comprehensibility than mispronouncing words with a low functional load (Munro & Derwing 2006: 529). According to Seidlhofer (2001: 59), it is important to know which individual sounds are distinctive in a language. In Finnish, for example, all vowel phonemes can have a single or double length (Suomi et al. 2008: 41), which means that vowel length is a distinctive feature in Finnish. Seidlhofer (2001: 59) gives the example of the Spanish consonant sounds /v/ and /b/, between which there is no opposition. Spanish speaking learners of English

need to, however, learn to recognize the opposition between words such as *berry* and *very*. In English, these two sounds have a high functional load, which is why it would be beneficial to focus on them in the language classroom. Munro and Derwing (2006: 529) support this view by stating that the functional load principle can help teachers guide their students in becoming "as comprehensible as possible to a wide range of interlocutors". Brown (1988: 221) has compiled a list of the most important and most conflated consonant contrasts in RP, which could be used as a functional tool in pronunciation teaching. The most important consonant contrasts in the list are presented as follows: /p b/, /d ð/, /n ŋ/ and /tʃ dʒ/. The rankings are made based on several factors, the two most important of which are how many minimal pairs exist with the contrasting pair of consonants as well as how frequently they are used in the language (Brown 1988: 603). As pronunciation errors are typically affected by the learners' L1, this list might not be accurately true for any given language classroom. Therefore, Brown (1988: 603–604) also suggests that teachers first examine the pronunciation errors made by their learners and then focus on the sounds with the highest functional load, and simply use the suggested list as a reference point.

3.3.2 Perception, production and phonetic awareness in pronunciation

Awareness appears to be a key issue in pronunciation teaching, and in research it can be linked to concepts like consciousness, noticing and perception. The first factor to be discussed is the link between perception and production, which is a subject closely related to the present study. According to Nowacka (2011: 59–60), although there are varying findings among the studies on the relationship between perception and production, the most popular understanding of the relationship seems to be that L2 learners' abilities to perceive and produce language are connected in such a way that perception precedes production. Therefore, in theory, training perceptual skills should facilitate the production and pronunciation of the target language. Derwing and Munro (2015: 36) support this claim by suggesting that poor perception might be the cause for many production difficulties. They explain that if one is not able to discriminate, that is, hear any difference between two sounds, the sounds can easily get mixed up, like the English /l/ and /ɹ/ contrast for Japanese speakers. Another problem can occur within processes of identification if one is not able to choose which sounds known to the person have just been uttered. While training perception might occasionally be the cure for problems in production, Derwing and Munro (2015: 36) remind us that the matter is more complex than it appears, and that "poor production is not always tied to poor perception, and the reverse is also true."

Nowacka (2011: 60) concludes that the mechanisms related to perception and production of language are "integrated rather than independent". The influence of native language phonetic categories on the perception of non-native sound contrasts is discussed in more detail in section 2.1.

The second issue related to awareness in pronunciation is phonological awareness. A number of studies (e.g. Aliaga-García 2007, Lord 2005) have shown that phonological training can improve the pronunciation of certain features in the target language, at least in the short term. Phonological training can make learners more aware of phonological phenomena, thus strengthening their phonological awareness. In other words, phonological awareness entails "linguistic awareness that is directed towards the sound of language", wherein attention can be paid to different linguistic units, such as syllables, rhymes, or phonemes (Elbro & Pallesen 2002: 18). Phonological awareness can also be described as the ability to "recognize, discriminate, and manipulate the sounds in one's language" (Anthony & Francis 2005: 256), which are skills that evolve quickly once literacy instruction is started in childhood. This development of phonological awareness is especially rapid for speakers of alphabetic languages with transparent orthographies (Anthony & Francis 2005: 257), e.g. German or Finnish. Phonological awareness can be considered an umbrella term for linguistic awareness focusing on the sounds of language. The present study focuses more precisely on *phonetic awareness*, since the tests measured awareness on the phoneme level, but the term phonological awareness is used when discussing the theme more broadly.

According to Elbro and Pallesen (2002:18), being aware of the phonology of a language and having explicit knowledge on it is useful mainly for the two reasons described above: learning to read and learning a foreign language. In order to learn how to read, one must be aware of how the writing system of the language works, and how its symbols relate to the *sounds* of the already familiar spoken language. This does not apply only to one's L1, but also to any additional language. As for learning a foreign language, however, the benefits of learning phonological skills are not restricted to the writing system alone, rather they are more connected to the spoken elements of the language. This is understandable since a foreign language learner is not yet familiar with the sounds of the new language. According to Marecka (2018: 1), in order to learn words, one has to make a series of phonological representations of them, either in chunks or smaller units (see Marecka 2018 for more detailed discussion on the process of creating phonological representations). De Jong et al. (2000: 269) have found that, especially

in the acquisition of phonologically unfamiliar words, learners with higher phonological sensitivity seem to do better, as being sensitive to novel speech units through words entails that one is more able to make accurate phonological representations (or restructuring old ones) of them, and the created representations of the sound units then help one to encode the new words containing these sounds. Marecka (2018: 29) suggests that this skill is especially important for less proficient speakers, as they seem to rely more on phonological short-term memory in learning words.

Phonological awareness skills begin to develop in early childhood. Elbro and Pallesen (2002: 17) explain that when a young child (about three years of age) is linguistically aware, he or she "enjoys or plays with the sounds of his or her language in nursery rhymes", "pays attention to an unusual pronunciation of a word" or "perhaps even corrects the pronunciation". Children learn how to manipulate language first at the sentence and syllable level and later at the phoneme level. This is the order in which phonological awareness is thought to progress during childhood (Puolakanaho 2007: 11–12, Goswami 2000: 253). At one end of the continuum is shallow sensitivity to larger units, whereas the skill to detect small units develops over time (Puolakanaho 2007: 11–12). In other words, the continuum can be seen as consisting of *shallow* and *deep phonological sensitivity* (Stanovich 1992). The development of phonological awareness skills has been studied in the Finnish context, and the results support the idea of a continuum of skills. The Jyväskylä Longitudinal Study of Dyslexia (JLD) studied the relation between the cognitive skills and reading fluency and accuracy of nearly 200 Finnish children during a 10-year period (Puolakanaho 2007: 44). In her thesis, Puolakanaho (2007) presents some interesting findings based on this data. The results showed that at the age of 3.5, children were already able to recognize syllable-length sound combinations in their mother tongue and create words from them (Puolakanaho 2007: 45). The skill to distinguish phonemes from words, i.e. segmentation, appears to develop between the ages 4.5 and 5.5 (ibid.). What is more, phonological awareness at the age of 3.5 was found to be a good predictor of later reading accuracy (ibid.). As these skills develop gradually, it is important to choose age-appropriate methods for measuring and training phonological awareness.

Elbro and Pallesen (2002: 18) look at phonological awareness from three different perspectives. Firstly, different linguistic units require different levels of awareness, which can be divided into syllable level, rhyme level, and phoneme level awareness. Although this categorization is widely recognized in research, one should notice that the different levels can also overlap, e.g.

with words that have a single-phoneme onset (*tin*) or a single-phoneme rime (*see*) (Goswami 2000: 252). Secondly, Ebro and Pallesen (2002: 18) suggest a distinction between different levels of phonological awareness based on the level of consciousness involved. That is, according to this model, phonological processes require either low-level or higher-level awareness. One of the researchers who have called for such division is Gombert (1992). The lower-level awareness, Elbro and Pallesen (2002: 18) explain, refers to implicit (or epilinguistic) awareness of rhymes and the sounds of words that seems to develop alongside language learning through playful language-related tasks. At the other end of the spectrum are the higher levels of awareness that enable the more demanding processes, such as phoneme deletion (Gombert 1992: 23, Elbro & Pallesen 2002: 18), e.g. knowing that deleting the last sound in *six* gives you *sic*. Finally, the third distinctive feature in phonological awareness, according to Elbro and Pallesen, is featured by the type of cognition involved. Synthesis, segmentation and identification are examples of such cognitive operations, and they are utilized in processes involving combining sounds into words, splitting words apart into separate phonemes and naming individual sounds (Elbro & Pallesen 2002: 18).

Different phonetic awareness measuring task types can be classified according to their levels of difficulty. According to Marecka (2018: 3), phonological awareness tasks can "require the recognition and/or manipulation of syllables, phonemes and other phonological units". The smallest segments of language, individual phonemes, are the most difficult to detect, whereas processing larger units, such as words, rhymes and syllables, is more effortless (Puolakanaho & Ketonen 2011: 138). Goswami (2000: 255) explains that the shallow sensitivity is typically examined by using the oddity task, in which one has to spot out the word whose phoneme pattern differs from the rest of the words, whereas the deep phonological sensitivity requires more analytic skills, and is thus measured by segmentation tasks. Children can often recognize and categorize parts of words quite painlessly, but naming, combining or replacing them is more challenging (Puolakanaho & Ketonen 2011: 138). By the time they begin school, children can usually combine sounds into words and remove the initial sound from a word in their mother tongue (Ketonen 2011: 139). Thus, the ways of measuring phonetic awareness can be adjusted to suit learners' individual skill levels by choosing what units of language are included in the test and what kind of tasks are used.

Maslanka and Joseph (2002) compared two popular phonological awareness techniques to see what kind of an effect each of them would have on American preschoolers' (N=20)

phonological awareness performance. The techniques were *sound boxes* and *sound sorts*. Sound boxes is a technique that uses a rectangle divided into 'boxes' based on the phonemes in a word. Children will then work with the sounds of the word, phoneme by phoneme, box by box to complete the word. Sound sorts is a method concerned with sorting pictures of words by paying attention to their common beginning, ending or rhyme (Maslanka & Joseph 2002: 272–273). While they found no significant differences between the two methods, both techniques proved to have improved the children's phonological awareness skills from what they had been in the first place.

Another related theme to be considered in regard to language learning is whether the learner is conscious about the learning process or not. The role of consciousness in language learning is debated. With his Noticing Hypothesis, Schmidt (1990: 149) argues that "subliminal language learning is impossible", which means that noticing certain target language objects is a requirement for learning. According to him, this view can be applied to all aspects of language, including phonology. However, the question is not as simple as it may seem. Schmidt (1990: 149) recognizes that implicit learning is possible and can be characterized as "the gradual accumulation of associations between frequently co-occurring features". Implicit learning seems to occur, when a learning task directs the learner's attention to relevant aspects of input (Schmidt 1990: 149). Seidlhofer (2001: 57) notes that conscious pronunciation training and some modern teaching techniques can contradict each other at times. For instance, Communicative Language Teaching (CLT) promotes meaningful interaction in authentic communicative contexts and therefore directs learners *away* from the linguistic system. Thus, in some cases, there is a conflict between the notion of authenticity and pronunciation teaching in formal settings. Since the goal of CLT is to learn how to convey messages, the focus should not be on purely linguistic drills or exercises. Seidlhofer (2001: 57) underlines that, on the one hand, pronunciation training requires conscious practicing, which may affect the authenticity of an exercise. On the other hand, some aspects of pronunciation occur without conscious effort and are not always accessible to analysis (Seidlhofer 2001: 56).

To return to the relationship between phonological awareness and reading, it can be argued that the development of phonological awareness is more rapid for speakers of languages with transparent vocabularies such as Finnish, which is often connected to better reading results. In such grapheme-phoneme regular languages, reading skills and phonetic awareness seem to develop simultaneously with a "bi-directional" relationship because of the direct phoneme-

letter connection (Elbro & Pallesen 2002: 19). The English language can be considered an exception when it comes to learning how to read. Aro and Wimmer (2003) compared the reading performance of speakers of seven different languages: German, Dutch, Swedish, French, Spanish, Finnish and English. Apart from the English-speaking children, at the end of first grade, the participants attained an accuracy level of 85 to 90% in reading tests. The figure was a less impressive 50% for the English-speakers (Aro & Wimmer 2003: 627). Phonological awareness is tied to lexical processes required in reading and learning to read (Goswami 2000: 260–261) and therefore, children who have problems in reading or spelling usually have weak phonological awareness skills. However, it is possible that the role of phonological awareness as a universal predictor of reading ability has been exaggerated, perhaps due to the dominance of English as a focus. Difficulties in "breaking down spoken words into phonemic segments" has been deemed a major obstacle in learning how to read, but this appears to only be true in languages with irregular orthographies (Aro & Wimmer 2003: 630). Even though the role of phonological awareness in learning to read may have been exaggerated, it could still be a useful factor to consider in FLL. The influence of phonological awareness might not be limited only to the target language, since there is some cross-language transfer, as was discussed in light of the research by Durgunoglu et al. (1993) on Spanish native-speakers' phonological awareness being a predictor of English word recognition (see section 2.2). Thus, testing phonological awareness could predict the level of success in FLL in general, since it does not seem to be language-specific.

As for the present study, phonological awareness is viewed on the phoneme level as our tests required the participants to work with phonemes, the smallest units of language, as the tasks included segmenting and blending, i.e. removing and combining phonemes. Therefore, the participants engaged in applying the higher level of awareness and the cognitive skill of segmentation. Furthermore, the present study did not focus on the shallow phonological sensitivity but through segmentation tasks examined the participants' deep phonological sensitivity.

3.3.3 Phonetic awareness and Finnish-speaking learners of English

Although phonological awareness and its role in learning how to read has been studied quite extensively in the Finnish context (see e.g. Puolakanaho 2007), learning phonological

awareness or receiving specific pronunciation teaching in foreign languages do not seem to have been a priority in the language classrooms, at least in the case of English (Lintunen 2004, cited in Tergujeff 2013: 29). Tergujeff (2013: 58) presents similar findings in her thesis, concluding that in Finnish schools phonetic training is not a priority in pronunciation teaching. It seems that pronunciation receives more attention at the primary level, where learning is typically more oral and less written (Tergujeff 2013: 45). In addition, phonetic symbols are taught at primary level, but not focused on in later stages. The techniques used for pronunciation teaching include "imitation, reading aloud and phonetic training" (Tergujeff 2014: 46). Tergujeff continues that a majority of Finnish teachers use EFL textbooks in the classroom, and the teaching could be considered textbook-oriented. It has been detected that as there was a lack of exercises related to suprasegmentals, that is, prosodic features, in the textbooks, they were also absent in the classroom (Tergujeff 2014: 53). Tergujeff (2014: 47) notes that the focus appears to be on segmentals that are traditionally considered difficult for Finnish learners, e.g. sibilants and affricates. We would, however, propose that the attention should be on examining differences between those sounds that have higher functional load and which, therefore, mean more to the intelligibility of one's speech.

It can be argued that teaching phonetics might be especially rewarding for Finnish speaking learners of English because of how different the two sound systems are from each other. Becoming more aware of the differences can then help the Finns who are used to very transparent connections between phonemes and graphemes in their mother tongue to understand the new language that does not follow such an order (Lintunen 2014: 2). Therefore, it is curious how even in Finland, despite the potential benefits of pronunciation teaching, language learners lack systematic teaching of foreign language phonetics and pronunciation on all levels of education before university (Lintunen 2014: 2) and rely greatly on their teachers and the textbooks used in the class (Tergujeff 2013: 52).

To conclude, there is some promising evidence on the effect that implicit phonetic training can have on learners' pronunciation. However, thus far, phonetic training has not been a priority in foreign language teaching in Finland. The authors of this paper emphasize the importance of awareness in pronunciation learning and would like to see more studies on the relation between phonetic awareness and learning pronunciation. It would be important, however, to make teaching and measuring of phonetic awareness age-appropriate and keep in mind the different levels of awareness and the cognitive processes related to it. Next, we present a detailed

description of the present study, an experimental study measuring second-graders' phonetic awareness of English consonants before and after a teaching intervention period.

4 THE PRESENT STUDY

In this chapter, we will present the data and the research questions as well as the participants and the interventions of this experimental study. After that, the methods of data collection and quantitative analysis will be explained. In chapter 5, we will report and analyze the results of the study, and finally, in chapter 6, the research findings will be summarized and their significant and implications considered in more detail.

4.1 Data and methods

The aim of this experimental intervention study was to examine Finnish-speaking second-graders' abilities to recognize and produce certain English consonant sounds, and to assess the influence of two different teaching approaches on those skills. In other words, the aim was to discover whether a short-term intervention could affect children's phoneme production skills in any way. More specifically, we were interested in knowing whether teaching that is focused mainly on phonetics or, contrastively, teaching focused on learning vocabulary through language showering would yield better results regarding children's phonetic skills. The research design was that of a traditional experimental study, since there were intervention groups that received teaching and a control group that did not receive teaching (Saloviita 2015: 198). The variables being tested in experimental studies are called independent and dependent variables (ibid.). An independent variable is the matter which the dependent variable is attempting to affect. In this case, the independent variable was the participants' consonant phoneme production abilities, whereas the dependent variable was the teaching in the intervention groups.

Similar experimental research projects focusing on the effects of teaching interventions on phonetic skills appear to be scarce in the Finnish context. Thus, the information gained from this study will bring some new insights into the field of the study of Finnish learners' English phonetic skills. Perhaps, if the short-term teaching interventions conducted for this study are

proven effective, this could work as an incentive for primary school teachers to focus more on English phonetics with young learners.

To reach the aforementioned research aims, the research questions for this study were formulated in the following way:

1. How did the production of English initial consonant sounds change during the intervention period in three research groups?
2. How did the production of English final consonant sounds change during the intervention period in three research groups?

To compare the effectiveness of conscious phonetic training with a language-showering period, two different teaching interventions were conducted. One group of children, the Phonetic awareness group (PA), received English teaching where the English sound system, phonetic awareness training and pronunciation exercises were the focus, whereas the other group participated in language showering classes focusing mainly on vocabulary (Language showering group, LS). To learn whether either of these teaching approaches had any notable influence on the participants' phonetic skills and to rule out other variables that might affect the results, a Control group (CG) that was not given any English teaching was included in the study. The children were the same age in all three groups. The two intervention groups and the control group were tested before (pre-test) and after (post-test) an eight-week period. To ensure the reliability of the comparison between the results of the three research groups, the number of weeks between the test sessions was the same for each group, whether or not they received any teaching. The pre- and post-tests measured the participants' abilities to produce English initial and final consonant sounds. Both test sessions were identical, which allows the direct comparison of the results before and after the intervention period.

The tests measuring the children's abilities to perceive and produce English consonant sounds included various tasks related to phonetic awareness. As explained earlier in section 3.3.2, phonetic awareness refers to a person's ability to recognize and discriminate the phonemes in a language. All in all, there were five different phonetic awareness tasks in the test package, but only the results from two sections, segmenting of initial and final sounds, were included in the data for this thesis. The other three blending and segmenting tasks were excluded, because focusing on one specific task type was considered more reasonable. The consonants that were

examined in the first segmenting task as initial sounds were /t θ s z ʃ ʧ ʤ w v/. The same sounds were chosen for the task of segmenting final sounds, with the exception of the sounds /ʤ/ and /w/. Out of these nine consonant sounds, /t/ and /s/ could be considered the most familiar to Finns, since there are equivalent, sometimes allophonic, sounds in the Finnish language. The inclusion of more familiar sounds can be encouraging for the participants, but it also enables the comparison of the development of phonemes of different levels of difficulty.

4.2 Participants

In this section, we will introduce detailed information about the participants and the three research groups of this study. Finally, the teaching interventions, the Phonetic awareness intervention, and the Language showering intervention, respectively, will be described.

The participants of this study consisted of 120 Finnish second-graders from five medium sized schools in Central Finland. The collaborating schools took part in a project related to earlier FLL, which was funded by the Finnish National Board of Education. However, prior to this study and related intervention periods, the participating classes had not been offered any English teaching. All in all, eight school classes were included. Informed consent was obtained from all participating children's parents before the beginning of the research project. All children in the intervention classes received English teaching, but only the ones with a research permit were included in the testing. The data from the Phonetic awareness intervention was collected in the autumn of 2017, whereas the Language showering and Control groups were tested in the autumn of 2018. The pupils were aged 7-8 at the time of testing, and there was no significant difference in age between the research groups.

The research groups were for most part school-specific, with the exception of the Phonetic awareness group (n=60) that consisted of four classes of participants from three different schools. The Language showering group (n=27) consisted of two classes of participants from one school, as did the Control group (n=33). The first two groups underwent an eight-week English teaching intervention (45min/week), whereas the control group had no English teaching during that period. For clarification, some information on the three research groups is summarized in Table 2.

Table 2. Information on the three research groups

Research group	Intervention period	Year of data collection	*N* of pupils
Phonetic awareness group	- English teaching focusing on phonetic awareness - 45 min/week during 8 weeks	2017	60
Language showering group	- English teaching focusing on vocabulary - 45 min/week during 8 weeks	2018	27
Control group	- no English teaching during the 8 weeks	2018	33

4.3 Teaching interventions

In this section, we will describe the contents and goals of the two different teaching interventions of our study: the Phonetic awareness intervention and the Language showering intervention.

4.3.1 Phonetic awareness intervention

The phonetic awareness intervention was conducted between September and November 2017 and performed with the help of several cooperating language teachers. Four school classes from three different schools took part in this intervention that consisted of eight 45-minute classes, organized during an eight-week period. The basis for this intervention was a material package created by Niilo Mäki Institute for the specific purpose of teaching phonetic awareness. The aim was to introduce children to the English consonant sounds through engaging and playful exercises, since playing and singing appear to be the most effective ways to teach languages to young children (Huotilainen 2019: 244).

To make learning fun and interesting, the exercises were designed to be part of an exciting pirate-themed story that unfolded during the eight weeks. The idea was that the children were pirates involved in a treasure hunt, moving from island to island and tackling different tasks on their way. The classes were teacher-led as the teacher had the detailed script of the story and the particular activities for each class in the teacher's manual. A map was used throughout the

intervention to illustrate how much of the learning content had already been covered and where the story would be heading next. The map worked as an incentive to stay motivated with the intervention.

The main focus of each lesson was to familiarize children with a specific set of phonemes and to practice their perception and production of the sounds through various activities. Despite the progression of the pirate story, all of the eight classes were designed to follow a similar structure, including imitation of phrases and words, comparison of single sounds (phonemes), and exploring and practicing how to produce the sounds in question. The classes made use of a wide range of methods in order to demonstrate the sounds and to make the learning more versatile. These included functional learning methods (performing certain gestures or movement when hearing a certain sound), oral activities (repeating words after the teacher, and imitating sounds), and the use of music, songs and visual aids (such as images and videos). The physical dimension of learning was also present in many of the activities. For instance, the children were encouraged to observe the movements of their mouths with the help of a mirror or to pay attention to the physical vibration while pronouncing certain sounds. To enforce learning and memorizing through repetition, the sounds learned during a class would also be revised in the following session. In addition, there was a revision session at the very end of the intervention, during which all of the sounds were revised and practiced once more.

While the focus of the intervention was clearly on raising phonetic awareness, each lesson also included learning full words and short phrases (i.e. common greetings such as *How are you?* and *Fine thanks!*). According to de Jong et al. (2000: 297), phonological training that does not solely rely on the phoneme sounds but includes the written letters through grapheme–phoneme relations, has proven to be more beneficial for learners. In this intervention, written language was part of the classes every time the phrases of the day were being introduced on pieces of paper presented on the blackboard.

During the intervention, the participants were introduced to the following ten sounds: /t θ ð ʃ z s ʧ ʤ w v/. In most of the lessons, the sounds were introduced in pairs, and so compared to one another or to other sounds that had already been examined. Many times, the consonant pairs would consist of a voiced and a voiceless sound. In addition to the consonants, one class considered the topic of long and short vowels. Nine of the ten consonant sounds that were covered during the intervention were included in the test that was carried out after the

intervention period. Some of the intervention exercises, such as paying attention to initial and final sounds, replacing them with other sounds, and blending sounds into words trained similar skills that were later examined in the test exercises of this study.

4.3.2 Language showering intervention

The language showering intervention was conducted between August and October 2018 and performed by the English teacher of the participating school. Unlike the Phonetic awareness group, this group did not use the pirate-themed phonetic awareness material package to learn English sounds. Instead, the focus was on learning vocabulary and simple phrases, however, through similar methods as in the phonetic awareness intervention. That is, functional learning (pantomime, physical activities) and oral activities (repetition, guessing games) were applied to a great degree. Visual aids were present in the form of pictures, drawing and coloring. Thus, the activities were similar, whereas the contents of the intervention were different. During the language showering intervention, the classes covered the themes of colors (e.g. *blue, red, yellow*), numbers (*1-10*), animals (e.g. *cat, bird, pig, mouse, goldfish*), vegetables and fruit (e.g. *carrot, cabbage, peaches, bell pepper*) and feelings (e.g. *happy, sad, angry, scared*). The three last lessons also included the writing of short and simple sentences using the vocabulary of the theme of the day (*I have a dog, You like cucumber, I'm sad*), however, before writing anything, the phrases had been used in oral activities as well. Based on the themes and their vocabularies, the estimated number of English words introduced during the intervention was around 60. Although the focus in this intervention was not on learning single phonemes, the children encountered a wide range of English sounds through the presented words. However, the vocabulary was chosen because of its suitability for English language beginners, therefore without much consideration for the sounds in the words.

4.4 Data collection

As stated earlier, the data for this study was collected in the autumn of 2017 for one research group (PA) and in the autumn of 2018 for the other two (LS and CG). The authors of this research paper participated in the data collection process in 2018, but not in 2017 as the data was collected as part of a larger research project.

The tasks applied in the test were designed according to commonly accepted methods of assessing phonetic awareness. The same set of tests was used before and after the intervention period. The phonetic awareness skills that were tested were *segmenting* and *blending*, however, only the results from the first two segmenting tasks have been analyzed in this paper due to our specific focus on initial and final sounds, as well as consonants rather than vowels. The first two tasks focused on segmenting initial and final sounds of English words (see Appendix 2). More specifically, the task type can be called a *syllable splitting test*. According to Adams (1990: 53), a syllable splitting test requires the test subjects to "break off the first phoneme of a word or a syllable". For instance, the researcher says "bear" and the child must split the first phoneme of the word and utter the sound "b" in isolation (Adams 1990: 53). This is how the initial and final sound splitting skills were tested and evaluated in our test. Such segmenting tasks require "explicit analysis" of smaller units of speech, and they can consequently be classified as deep phonetic awareness tests (Reitsma 2002: 37). Reitsma (2002: 36) emphasizes the importance of choosing an age-appropriate approach for measuring phonetic awareness. He explains that some children may not know how to pronounce phonemes in isolation, so age-appropriate tasks should not require this kind of experience. Thus, phonetic awareness tasks should always have clear instructions (Reitsma 2002: 36). Even though the tasks utilized in this study required phonetic awareness on a deeper level, the clear instructions given to the participants made the study successful. The data collection process and the segmenting tasks will be explained in more detail below.

Before we go on to describe the individual tests of this study in more detail, we ought to explain a preparatory test that was carried out in the classroom simultaneously for each pupil in the class prior to the actual tests. The results of this test are not included in the data of this thesis. This pre-test could be called a priming exercise that prepared the children for their individual tests and was meant to ensure that the children understood the point or the nature of the test as they came to the individual test. In this priming task, we examined the pupils' ability to perceive initial and final sounds, first in Finnish and then in English. Whereas in the individual tests (as will be explained in detail below) the children were to produce the initial or final sound they heard in a word, in this priming exercise, however, they simply chose the appropriate sound from two options, without producing any sounds themselves. As was discussed in section 3.3.2, perception and production are closely connected, and perception plays a role also in the production of foreign sounds. The whole-class priming task functioned more on the perception level, whereas in the individual tests the children had to also deliver the correct production.

The premise of the whole-class task was rather simple. When the researcher had given the test instruction and made sure (with the help of an example) that the children knew what to do, the test could begin. For each task, the researcher would utter two short words (represented by the number 1 and 2 in an answer sheet, see Sample 1), followed by a sound (a phoneme) that appears in only one of the two words. The pupils were then asked to choose which of the two words they think included the sound in question and mark their answer accordingly either ticking the box 1 or 2 in the answer sheet. The answer sheet was also coded with symbols next to each answer row to help the children keep tract. The question used for each part of the test followed the same structure, as exemplified in Figure 6 below:

> *Look at the row with the symbol of a hand. Chip (pointing on number 1). Tip (pointing on number 2). At the beginning of which word did you hear the sound /ʧ/? I repeat: Chip. Tip. /ʧ/.*

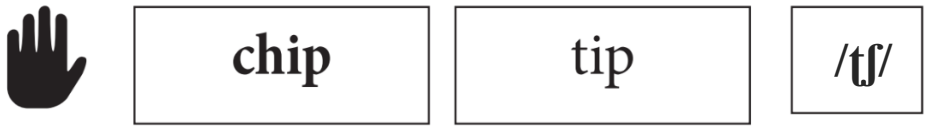
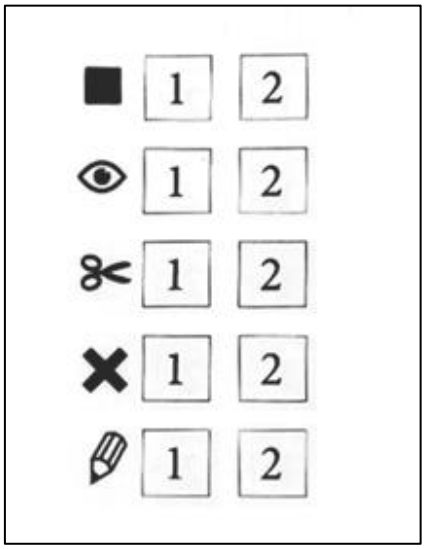


Figure 6. Example of the whole class priming exercise on sound perception



Sample 1. Part of the answer sheet for the whole class priming exercise

In the priming exercise, there were both Finnish and English words. The first five-word pairs were in Finnish, three of which regarding the perception of initial sounds and two of final sounds. After the less difficult section with Finnish phonemes, the researchers continued on to the more demanding and foreign English sounds. The section with English words also started with the recognition of initial sounds. The nine initial sounds (/t θ s z ʃ ʧ ʤ w v/) that were included in this exercise were the same ones whose production was studied through the individual tests in the present study. After the initial sounds the exercise moved on to final sounds. The seven final sounds (/t θ s z ʃ ʧ v/) included were also identical with the ones studied in the individual test. Finally, the last part of the exercise concentrated on differentiating between some (initials) sounds that can be challenging for many Finnish speakers. These sound pairs included /t/ and /θ/, /θ/ and /ð/, /s/ and /z/, /ʧ/ and /s/, and /w/ and /v/. In this section, most of the sounds appeared in non-words. To clarify, these whole-class tests concerning mainly the recognition of initial and final sounds were not analyzed as part of this study, and they were finally only used as a way to prepare the children for their individual tests.

After the whole-class exercise, the individual test sessions were completed. The individual test sessions all followed the same pattern. First, the researcher read aloud the instructions and made sure that the child understood the nature of the tasks (see Appendix 2). All the instructions in the test situation were given in Finnish as the children could not be expected to know any English. It was emphasized that to succeed in the tasks, the child was not required to know the meaning of the English words, since the focus was only on phonemes. Some children would occasionally ask the researcher to repeat a word, or they would check from the researcher that they had understood the task instructions correctly, but other than that the test format seemed to be clear for the children and no further questions arose. However, in some cases where the child did not seem to know what to say or do, or was perhaps just shy, the researcher would try to encourage the child and remind him or her of the instructions for the task.

After clarifying the instructions, the researcher turned on the recording device so that the test could begin. Recording participants' speech while gathering data through a test is a commonly used procedure when studying specific phonemes (Seliger & Shohamy 1989: 155), and the method was considered appropriate for this study as well since the recordings were later used in rating the participants' performances. The researcher then proceeded to reading aloud individual English words one by one from the task sheet (see Appendix 2). After each word, the child was to pronounce the initial sound of the word according to what he or she had heard.

The researcher marked down a sign for a correct or an incorrect answer for each sound on the test sheet, although the answers were later checked once more by listening to the recordings. When the initial sound task was completed, the child was given instructions for the final sound task, which was carried out in the same manner. The nine initial sounds and the words in which they appeared were the following: /t/ in *tin*, /θ/ in *third*, /s/ in *salt*, /z/ in *zombie*, /ʃ/ in *shave*, /tʃ/ in *chimp*, /dʒ/ in *job*, /w/ in *will* and /v/ in *very*. The final sounds and the matching words were the following: /t/ in *pet*, /θ/ in *south*, /s/ in *mouse*, /ʃ/ in *wish*, /tʃ/ in *such*, /z/ in *freeze* and /v/ in *gave*. During the test session, the researcher always marked down whether he or she thought the child's answer was correct or not, but due to the limited time available for each test session, there was not always time for much consideration. For this reason, the answers were later verified via the test recordings.

In the individual test sheet, there were two other tasks that were excluded from analysis, one which tested blending and another one that measured segmenting skills in a different way than the first segmenting task described above. In the blending task, the researcher pronounced a list of segments and asked the child to connect the segments into a coherent word. Adams (1990: 54) gives the example of /m/, /a/, /p/ and /map/ to demonstrate the exercise. The other segmenting task concerned syllable splitting, and it asked the participants to pronounce what is left of a word when a phoneme is removed. Adams (1990: 53) gives the words *pink* and *ink* as examples, e.g. the researcher says *pink* and the child ought to say *ink.*

4.5 Analysis

This section contains the description of the analysis process of the data of this study, which includes the evaluation and rating of the answers gathered from the individual tests. Moreover, the handling of the data and the methods of statistical analysis are explained in the latter part of this section.

4.5.1 Rating and evaluation

After the data collection process, the participants' answers were rated. First, the recordings from the individual test sessions were exported to a computer. The researchers went through the data by listening to the recordings through headphones and evaluating the children's performances one by one, rating each answer on the scale of zero to two. Two points were given for answers

that clearly showed that the child had been able to single out the specific sound and deliver the correct initial or final phoneme in question with accuracy. One point was given in cases in which the child produced the name of the initial or final letter of the word instead of the sound, for instance, *zeta* instead of /z/. No points were given if the child produced more than one sound, a consonant-vowel or consonant-consonant combination. Naturally, zero points were also given if the child uttered a completely incorrect sound.

In addition to the recordings made in 2018, the data also included recordings of individual tests from 2017, so there were recordings made by several research assistants. When evaluating the answers, the researchers did not listen to the recordings of the sessions they had personally been involved in, unless it was to double-check an unclear answer with another researcher. This way each rating would be based on two researchers' opinion instead of just one, as the first-hand evaluation had already been marked on the side of the researcher's test sheet in the actual test situation.

Rating performances by ear can be complicated, which is why it was sometimes challenging to determine the correctness of an answer. In the test situation, the child was expected to utter the initial or final consonant sound without the following or preceding vowel sound, but sometimes a hint of a vowel sound followed or preceded by a correct consonant sound was detected. In these cases, the recording was double checked by the other researcher, the situation was negotiated, and the answer was graded based on the negotiated decision. One factor that could have affected the results of the study is the fact that there were several research assistants involved in the study. Each research assistant had his or her own personal ways of pronouncing the words, which could have also affected the children's performance. Many research assistants were English students or English teachers, so their pronunciation could be deemed accurate, but having one pronunciation model for all children would have made the test more consistent. Most of the unclear rating situations could be resolved, but when it came to the distinction between /f/ and /θ/ as well as /v/ and /w/, the evaluation was deemed too inconsistent to be considered reliable. The issue of rating acoustically similar sounds is discussed thoroughly in chapters 5 and 6.

4.5.2 Data handling

After the rating process, the data was fed into the IBM SPSS statistical analysis program. In addition to the points awarded for each participant's performance on each sound, additional information about the participants was inserted into the program. This information included school name, school class name, participation in pre- and post-tests, number of absences, participant's sex, date of birth, as well as the dates of the interventions and testing. The participants' names and school information were coded with numbers to conceal their identities. With all this additional information the researchers were able to compare the groups to each other and make sure that there were no significant differences regarding group size or the children's age at the time of testing.

A record of absences for each intervention participant was kept, because if a pupil was absent from the intervention for more than two times, he or she was excluded from the final data. Moreover, if a child was not able to attend both the pre- and post-test, his or her data had to be excluded, as no comparison could have been made between the starting and finishing points. Two participants from the Phonetic awareness group were excluded from the data because they had been absent from the intervention more than two out of eight times. Participation in the intervention was crucial for the reliability of the research project, so their results were not included in the analysis. Also, a whole class from the Phonetic awareness group was removed because they had not been able to participate in the post-test. Moreover, 16 participants from other classes in the Phonetic awareness group, five participants from the Language showering group, and three participants from the Control group had for one reason or another not been able to participate in either the pre- or post-test of the study and were, therefore, excluded from the final data. Due to the limited resources of the study, the data for the absent schoolchildren was not collected afterwards. In the end, the final data of this study consisted of the results of a total of 120 pupils.

Once all data was fed into the statistical analysis program, the data was analyzed with the help of crosstabs and paired samples t-tests. With crosstabs it is possible to investigate the link between two variables (Valli 2015: 82). In the case of this study, we were interested in knowing whether the phonetic intervention group had a higher percentage of correct answers than the other two groups. Thus, it was relevant to know how the variable of group correlated with the variable of test scores. T-tests are used to rule out the possibility of random variation by

comparing the mean scores of two groups of data (Valli 2015: 116). If there is a statistically significant difference between the two sets of data, the result can be considered generalizable. For the purposes of the present study, the mean results of the pre- and post-tests were compared to one another to see whether the change in the scores after the intervention period was significant. Statistical significance is illustrated by t- and p-values; a large (negative or positive) t-value and a small p-value point towards significance (Runkel 2015). A p-value of less than 0.05 is considered a cutoff point (Valli 2015: 103). For instance, if the p-value (significance) is 0.01, there is a 1% chance that the results were caused by a coincidence.

5 THE EFFECTIVENESS OF TWO TEACHING INTERVENTIONS ON THE PRODUCTION OF ENGLISH CONSONANTS

The aim of this study was to examine the effectiveness of two different teaching interventions on Finnish second-graders' production skills of English consonant phonemes. For this purpose, three research groups were created. First, there was the Phonetic awareness group that focused on developing phonetic awareness, secondly, the Language showering group that mainly practiced vocabulary, and thirdly, the Control group that received no English teaching during the intervention period.

Nine initial sounds, /t θ s ʃ z ʧ ʤ w v/, and seven final sounds, /t θ s ʃ z ʧ v/, were examined in this study. Among these phonemes, there is one plosive /t/, two affricates /ʧ ʤ/, three sibilant fricatives /s ʃ z/, the interdental and labiodental fricatives /θ v/ and one approximant /w/. The phonemes /t/ and /s/, and perhaps /v/ and /w/ could be considered familiar to Finnish-speaking pupils, while the other sounds are nonexistent in native Finnish words. Thus, there is some variation in the supposed level of difficulty of the measured phonemes.

Next, the results of this experimental intervention study are presented. The section begins with the discussion of the results gathered by investigating the production of initial sounds, and it continues with the results from the final sound tests. The three research groups' results before and after the intervention period are compared to each other to see, firstly, how the production of each sound has changed during the study period and, secondly, how the groups' performances differ from each other. In the results section, the phonemes are grouped together based on similar patterns perceived in statistical analysis. The sounds that were produced significantly better after the phonetic awareness intervention are grouped together, as well as the sounds whose production underwent no substantial change in any research group.

5.1 Initial sounds

The results presented in this section will answer the first research question regarding change in the initial sounds in three research groups during the intervention period. In the Tables 3–8 and 10–14 presented below, the darker column on the left represents the mean scores of the

individual groups in the pre-test, i.e. before the intervention. Respectively, the lighter column on the right shows the mean scores of the groups in the post-test done after the intervention period. In this phoneme segmentation test, points were given on a scale of zero to two, that is, the highest possible score was two points and the lowest score was zero points. One point was awarded if a participant could not pronounce the correct sound but was able to name the letter, e.g. *zeta* instead of the sound /z/. The abbreviations for the research groups presented in the tables are the following: Control group (CG), Language showering group (LS), and Phonetic awareness group (PA). The results of the statistical analysis are presented with t- and p-values. The greater the t-value and the smaller the p-value, the more significant the change.

5.1.1 Initial sounds with the most change

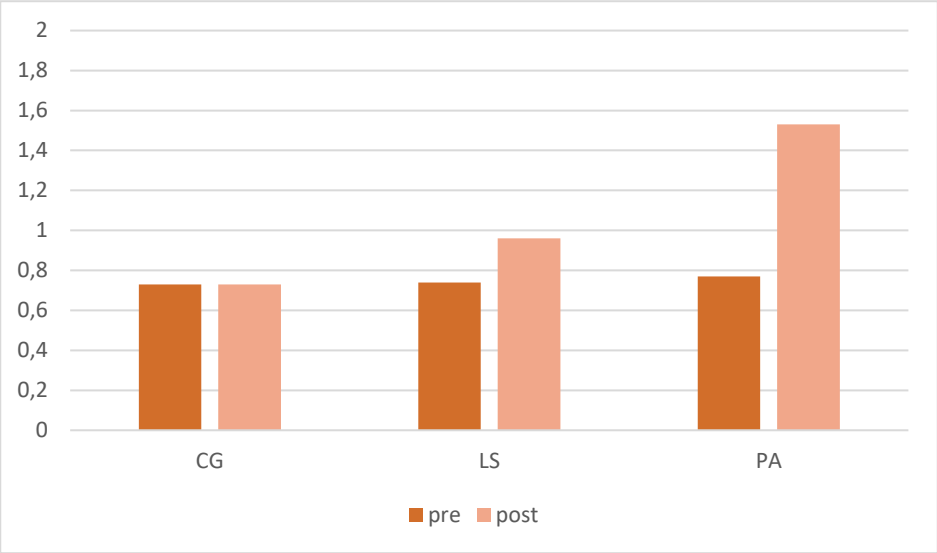
The four initial consonant sounds that yielded clearly different results between pre- and post-testing were the affricates /tʃ/ and /dʒ/ and the sibilants /ʃ/ and /z/. In this section, each phoneme will be discussed individually.

Voiceless palatal affricate /tʃ/

The first consonant sound to be discussed is the voiceless palatal affricate /tʃ/. This phoneme was tested in the context of the word *chimp*. All three test groups had a very similar starting point with mean scores all under one point, i.e. 0.77, 0.74 and 0.73 points for PA, LS and CG, respectively. Between the pre- and post-tests, there was no change in the production of this sound in the Control group, the average score remaining at 0.73 points. In contrast, the results from the intervention groups showed development, which could be interpreted as a consequence of the English teaching those groups participated in. Some improvement was detected in the results of the Language showering group, as their mean score increased from 0.74 to 0.96 points. However, the change was not statistically significant ($t(26)=-1.140$, $p=.265$). The improvement in the LS group could be a result of the children becoming more accustomed to hearing and maybe imitating the affricate sound, although they did not consciously study the English consonant phonemes but only encountered sounds through vocabulary training. The results of the Phonetic awareness group, however, seem to demonstrate the effectiveness of the conscious training of the English phonemes, as 76.7% of the participants in the PA group ($n=60$) identified and produced the correct sound in the post-tests compared to the 38.3% in the pre-

test (see Table 9). The average score of this group went up from 0.77 to 1.53 points, the improvement being statistically very significant, $t(59)=-5.077$, $p<.001$.

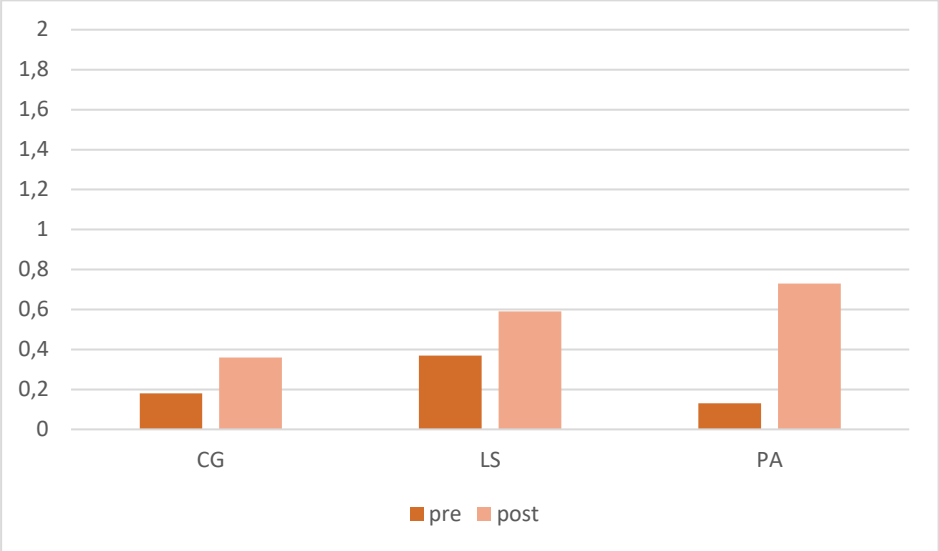
Table 3. Mean scores in pre- and post-tests for all research groups: initial sound /tʃ/



Voiced palatal affricate /dʒ/

The voiced palatal affricate /dʒ/ was introduced in the word *job*. This phoneme yielded poor results in all three groups in the pre-tests, with mean scores of 0.13, 0.37 and 0.18 for PA, LS and CG group, respectively. Even though the starting level of the Phonetic awareness group was the weakest of all groups, the participants in that group improved their production of the sound the most, the mean scores growing from 0.13 to 0.73, showing statistically significant improvement, $t(59)=-4.381$, $p<.001$. In the pre-test, merely 6.7% of the participants in the PA group ($n=60$) answered correctly, whereas the figure was 36.7% after the intervention (see Table 9). The Language showering group increased their mean score from 0.37 to 0.59, whereas the score of the Control group grew from 0.18 to 0.36. The change in these groups was not significant, $t(26)=-1.000$, $p<.327$ for the LS group, and $t(32)=-1.359$, $p<.184$ for the CG. The poor results in the pre-tests could be explained by the unfamiliarity of the sound to most Finns as this voiced affricate does not exist in native Finnish words. Again, the greatest improvement within the PA group could be understood to be due to their intervention that included phonetic training.

Table 4. Mean scores in pre- and post-tests for all research groups: initial sound /dʒ/



There are no affricates in Finnish, which is why /tʃ/ and /dʒ/ can be expected to be difficult for Finns (Sajavaara & Dufva 2001: 250). What is more, the findings seem to suggest that voiced sounds are more problematic for Finns, as the performance in the voiced /dʒ/ was clearly poorer than in the voiceless /tʃ/. Finns often produce these affricates too forward in the mouth, which makes them sound like [ts] and [dz], that is, "too high and sharp in quality" (Morris-Wilson 1992: 46). The resulting sound will not be accurate if the fricative that is following the plosive is not produced correctly, so the different English sibilants must be mastered. Taking into account the difficulty of these sounds, it is impressive that the participants of the PA group were able to produce these demanding sounds significantly better in the post-tests.

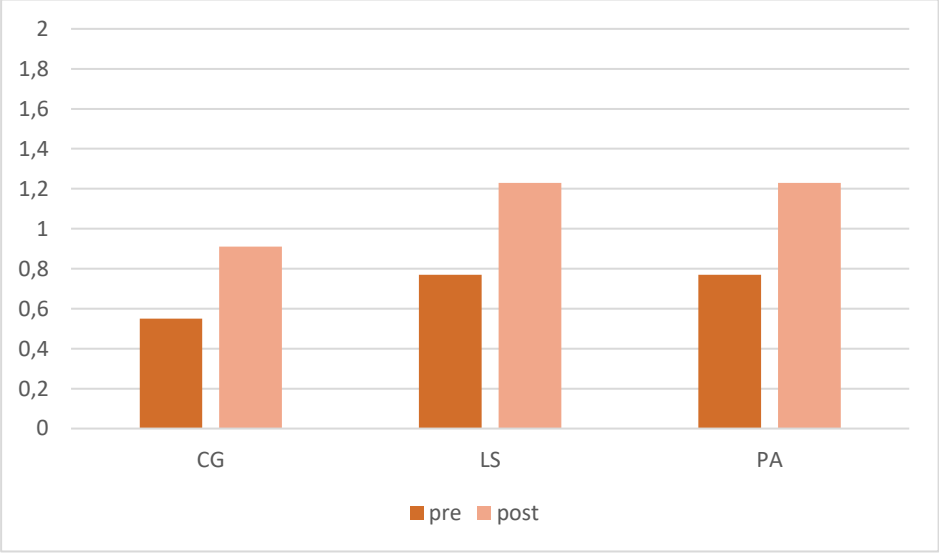
Voiceless postalveolar fricative /ʃ/

The next sound to be discussed is the voiceless palatal or postalveolar fricative /ʃ/, which appeared as an initial sound in the word *shave*. All three research groups improved in their production of the sound. The PA group and the LS group had exactly the same mean scores in the pre- (0.77 points) and post-tests (1.23 points). The scores of these two groups increased more than the scores of the members of the Control group, whose mean score grew only from 0.55 to 0.91. The results of the PA and the LS group showed statistically significant improvement, slightly more in the PA group ($t(59)=-3.617$, $p<.001$) than in the LS group ($t(26)=-3.407$, $p=.002$). The improvement measured in the Control group was not significant ($t(32)=-1,644$, $p=.110$), and only 45.5% of the group ($n=33$) could produce the sound accurately

in the post-test, whereas the percentage was 61.7% for the PA group (*n*=60) and 70.4% for the LS group (see Table 9).

This phoneme is not a part of all Finns' repertoire, but it does exist in some loan words, such as *shokki* (shock) (Suomi et al. 2008: 37). Suomi et al. (2008: 36–37) speculate that the sound /ʃ/ might in the future become a more prevalent member of Finnish people's phoneme inventories as the use of English is likely to increase in the Finnish society. Nevertheless, they remain sceptical about this view since the orthography of the words including the sound /ʃ/ is not consistent, and the number of words the sound appears in is still quite small.

Table 5. Mean scores in pre- and post-tests for all research groups: initial sound /ʃ/



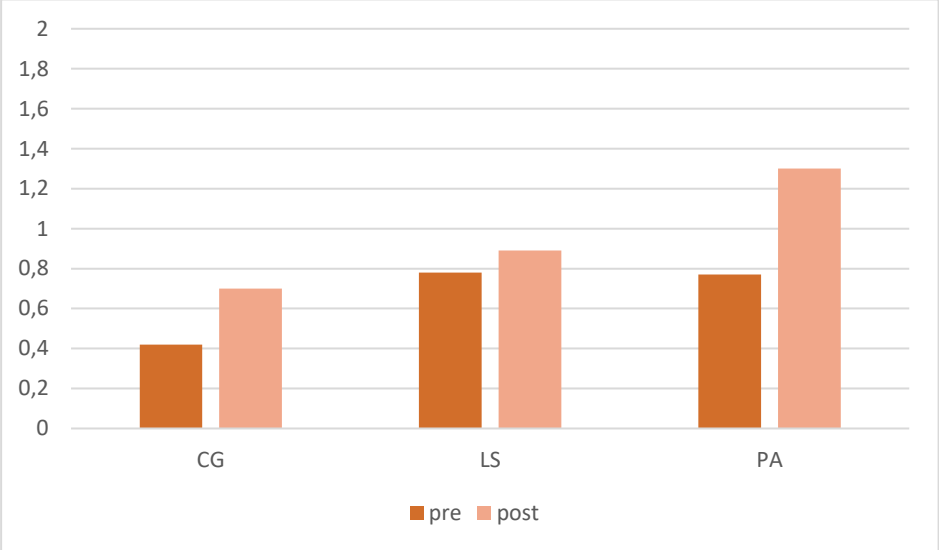
Voiced alveolar fricative /z/

The voiced alveolar fricative /z/ was introduced in the word *zombie*[4]. All research groups improved their performance between the pre- and post-tests. The improvement was clearest in the PA group, the mean scores rising from 0.77 to 1.3, 38.3% of the participants (*n*=60) being able to produce the correct sound in the pre-test, and 65% in the post-test (see Table 9). The improvement was therefore found to be statistically significant ($t(59)=-3{,}768$, $p<.001$). As for the LS group, the pre-tests yielded the mean score of 0.78, growing only up to 0.89 in the post-tests. In the Control group, only 21.2% of the participants (*n*=33) uttered the correct sound in

[4] This word was written as *zombi* in the test sheet. However, the pronunciation of the word was equal to that of *zombie*.

the pre-test with the mean score of 0.42. Their percentage of correct answers was 33.3% in the post-test, and the mean score rose only up to 0.7. Thus, the change was not statistically significant in the LS group ($t(26)=-.593$, $p=.558$) nor in the Control group ($t(32)=-1.867$, $p=.071$).

Table 6. Mean scores in pre- and post-tests for all research groups: initial sound /z/



As Morris-Wilson (1992: 70) points out, the four English sibilants /s ʃ ʒ z/ can be easily confused by Finns, since the only sibilant found in the Finnish language is /s/. The fricative /z/ is also voiced, which might add to the difficulty of the sound for Finns who might only be used to their voiceless sibilant, although there are some cases when /s/ can become voiced too (Suomi et al. 2008: 27, 36). It is known that Finnish learners of English struggle with the distinction between /s z/ and /ʃ ʒ/ (Morris-Wilson 1992: 70), so the rather low 1.2 average score in the segmenting test of /z/ and /ʃ/ could be predicted.

5.1.2 Initial sounds with little change

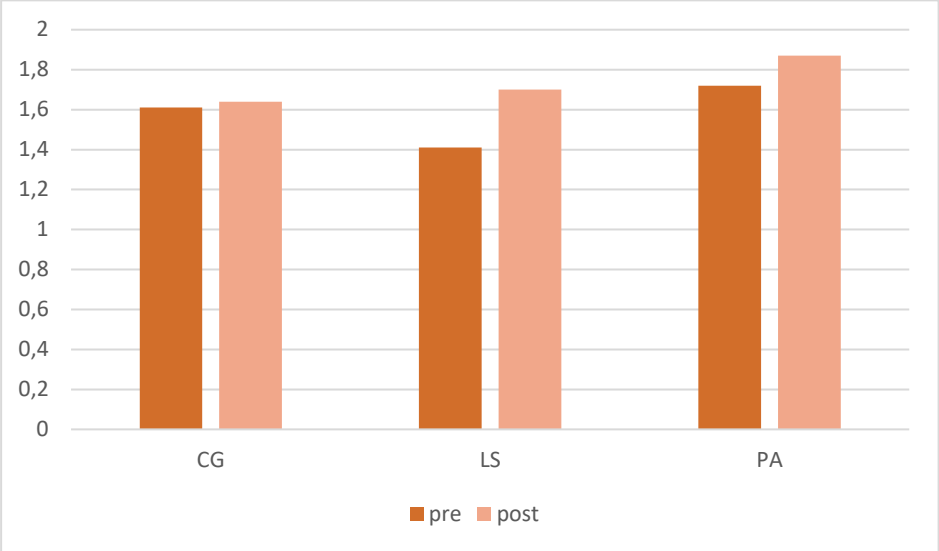
The tests for the sounds /t/ and /s/ yielded similar results in all research groups. All three research groups had high mean scores already in the pre-tests, and the results did not improve significantly during the intervention period. Thus, these phonemes are grouped together as sounds whose production remained similar after the intervention period.

Voiceless alveolar plosive /t/

The voiceless alveolar plosive /t/ is in most Finnish speakers' phoneme register and, thus, familiar to many Finns. The sound was tested in the context of the word *tin*. The results of the pre-test illustrate the familiarity of this consonant sound, the percentages of correct answers being as high as 85.0%, 63.0% and 78.8% for PA, LS and CG, respectively (see Table 9). The improvement measured in the post-tests was not statistically significant in any of the research groups, but there was least development in the Control group, the mean score changing from 1.61 to 1.64, $t(32)=-.154$, $p=.879$. The LS group scored 1.41 points in the pre-test and 1.7 points in the post-test, $t(26) = -1.986$, $p=.058$. The PA group's mean score grew from 1.72 to 1.87, $t(59) = -1.539$, $p=.129$. Although no significant improvement in any group could be found, it is worth noting that it was more common in the Language showering group and in the Control group to get 0 points than what it was among the participants of the Phonetic awareness group.

One could assume that Finnish children could recognize and produce /t/ without any difficulty, so the fact that some children uttered inaccurate sounds in the tests is an interesting phenomenon. Perhaps that could be explained by some children not being able to perform under the test circumstances due to anxiety or nervousness. On the other hand, even though /t/ can be found in both the English and Finnish phoneme systems, there are minor differences in the realization of the sound. In English, after the release phase of a voiceless plosive, there is often a period of noise before the vowel sound (Ogden 2009: 102). This phenomenon is called aspiration, and it is characteristic of the English voiceless aspirated plosives /p t k/ (ibid.). As this quality of English plosives could be unfamiliar to the Finnish second-graders who took part in the study, the word *tin* (aspiration transcribed as [t^{h}in]) could have caused confusion for them. Perhaps the initial [t^{h}] sounded like a more familiar [ts] to some of the participants, which resulted in an incorrect answer.

Table 7. Mean scores in pre- and post-tests for all research groups: initial sound /t/



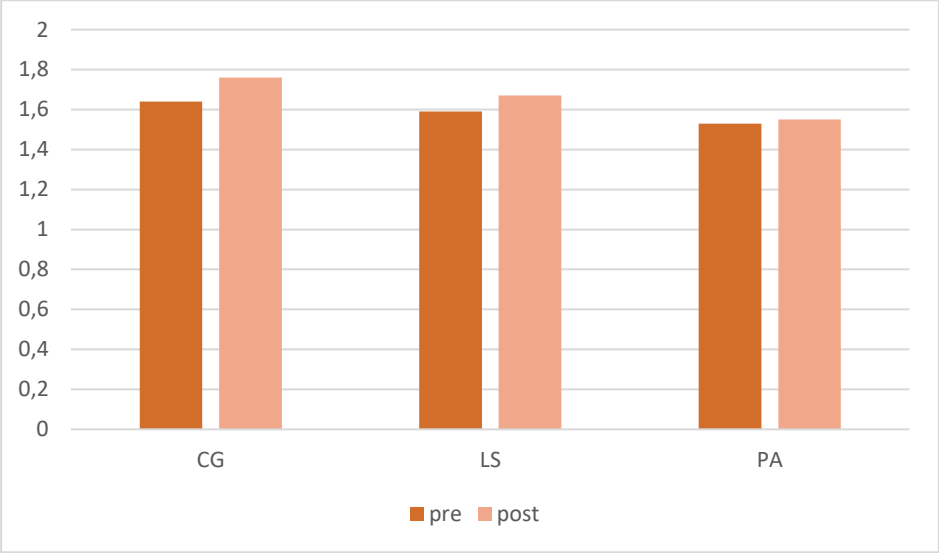
Voiceless alveolar fricative /s/

The voiceless alveolar fricative /s/ is the only sibilant sound that can be found in native Finnish words. This sound was measured in the context of the word *salt*. In the pre-tests, the starting level was strong in all groups, the mean scores being 1.53, 1.59 and 1.64 for PA, LS and CG, respectively. Unlike in the other sounds discussed so far, here the PA group scored lower than the other groups and its improvement was less significant. The percentage of correct answers in the PA group (n=60) were 76.7%, while it was 81.5% in the LS group (n=27) and 87.9% in the Control group (n=33) (see Table 9). That is, in the post-tests, the PA group improved their score only up to 1.55 points (t(59)=-.129, p=.898). The LS group showed some improvement, growing the mean score up to 1.67 in the post-test (t(26)=-.420, p=.678). Finally, the Control group scored 1.76 points (t(32)=-.725, p=.474), therefore showing most improvement in the production of the sound. Although this result is contrary to most of the previously described findings in other sounds, no quick conclusions should be made about the matter. In fact, the differences between the test groups were not as great with this sound as with the previously presented affricate and fricative sounds, since with /s/ the mean scores did not change significantly in any of the groups.

Furthermore, the similarity in statistical development with /s/ and /t/ is an interesting phenomenon. With both of these sounds, the starting level of all groups was strong, and the teaching interventions did not have any significant effect on their already high level of

competence. Unlike with some other sounds, in the case of /t/ and /s/, the PA group's performance was not affected by the teaching period. This is surprising, since the aim of the teaching provided for the Phonetic awareness group was, after all, to make children more aware of individual English phonemes and to train their pronunciation. Perhaps, since the participants of the phonetic awareness teaching intervention became aware of other sibilant sounds such as /ʃ/ they could have confused the sibilants or overcorrected to a more English-sounding phoneme, /ʃ/. It is also possible that the short teaching intervention was not enough to teach the children to differentiate the two sounds.

Table 8. Mean scores in pre- and post-tests for all research groups: initial sound /s/



5.1.3 /θ w v/ as initial sounds

In this section, we will discuss the issues encountered with the voiceless fricative /θ/, the approximant /w/ and the voiced fricative /v/. These phonemes were among the nine original initial sounds examined in the tests. However, it turned out that the results for these three sounds could not be considered reliable, which is why they are grouped together in this section and excluded from the statistical analysis.

The issue with the /θ/ sound (introduced in the word *third*) arose already in the test situation as well as in a later phase, when the researchers listened to the recordings from the test sessions and gave final scores to each participant. It proved to be very challenging for the researchers to hear whether the sound the children made was the target sound, i.e. the dental fricative /θ/ or a

very similar labiodental fricative /f/. At times, the researchers were even contemplating between /θ/ and the alveolar fricative /s/. As was presented in Figure 4 (see section 3.2.3), the voiceless interdental /θ/ looks very similar to the voiceless labiodental fricative /f/, which indicates that the sounds are indeed similar sounding. Produced in isolation, without a context or the rest of the vowel and consonant sounds of a word, the two phonemes, /f/ and /θ /, could easily be confused with one another. Thus, if the children had been asked to produce consonant-vowel (CV) or vowel-consonant (VC) combinations, the fricative sounds could have been easier to differentiate. Now, even in the test situation, where the researcher was sitting across a participant and could look for cues from the way the child moved his or her articulatory organs, it was very difficult to definitively decide which sound was uttered. If the rating process was difficult in the live test situation, it was even more challenging afterwards. The quality of the recordings was adequate, but occasionally the children articulated their answers so softly and quietly that the recording device could not pick up all the subtleties needed for reliable phonetic analysis. What is more, the spaces available for the test sessions in the school buildings were not always sound-proof, so the noise outside the room could also be picked up by the recording device. That way, these unwanted sounds occasionally interfered with the children's answers. The resemblance of the /θ/ and /f/ sounds appears to be a commonly known issue among linguists, and, for instance, Brown (1988: 599) notes that these two sounds "may be difficult to distinguish in bad transmission conditions".

Surprisingly many fricatives can sound very similar in isolation, especially when pronounced by English beginners, who are only getting used to producing the sounds of the language. The problems that emerged in the recording and rating phases, as well as the fact that the researchers could not agree on the correctness of the answers in all cases, made the results seem unreliable. We have reason, however, to assume that it was not just the researchers' inability to distinguish the produced sounds, but that the children indeed often perceived /θ/ as /f/, as many of the participants actually said the name of the letter they intended to make, and some of them also went on to produce the sound of the letter they had just mentioned ("that's <f>, /f/"). Moreover, as Morris-Wilson (1992: 59) concludes, /f/ does not seem to cause Finns any issues, so it is pronounceable by many Finnish speakers. Therefore, as /f/ is in many Finns' phonetic inventories and it is pronounceable for them, it is possible that the issues lie in both perception and production of /θ/. The Finnish children clearly replaced the unknown /θ/ phoneme with the familiar /f/, because of the absence of /θ/ in their phonetic maps and could not imitate the /θ/ because they perceived it as /f/. Derwing and Munro (2015: 36) point out that these types of

perception issues might cause problems in one's production, however, this does not always have to be the case.

Fortunately for the English learners, since /θ/ and /f/ are acoustically so similar, there are not many minimal pairs with these two phonemes as initial sounds that could cause confusion if mixed-up. These two sounds is listed as one of the most conflated consonant phoneme pairs in English (Brown 1988: 604), however, not mentioned as one of the most important distinctions to master (ibid. 603). In other words, the phonemes are often mixed up, but the error is not significant for understandability. In a similar fashion, G. Brown (1974, cited in A. Brown 1988: 593) suggests that the distinction between the voiceless /θ/ and the voiced /ð/ (not studied here) is not a priority in pronunciation teaching. Instead, she suggests the sounds be replaced with very similar /f/ and /v/ sounds, respectively, since these do not carry much functional load. In other words, according to G. Brown, it is not useful to study /θ/ and /ð/, if they can be replaced with easier sounds. In addition to a low functional load, what can make the distinction between /θ/ and /f/ seem even less like a priority is the fact that even some native speakers replace /θ/ with /f/. This phenomenon is called TH-fronting, during which the dental fricative /θ/ is replaced by the labiodental /f/ (Wells 1982: 328). The phenomenon is especially characteristic of the British Cockney accent (Wells 1982: 328). Brown (1988: 599) adds that due to the similarity of the two sounds listeners have grown accustomed to recognizing them according to the context. Hence, perhaps the speaker's perfect production of /θ/ and /f/ is not as important as the listener's ability to detect the correct meaning based on the communicational context.

Similar challenges in the rating process appeared with the sounds /w/ (in *will*) and /v/ (in *very*). It turned out to be extremely difficult to verify via recording whether the sound the participants produced was the voiced bilabial /w/ or the voiced labiodental /v/, or possibly something else. The distinction between the two sounds is recognized as a problem for Finnish learners of English (see Lintunen 2014), so the issues here could be predicted. There is a relational difference with the occurrence of these sounds in English and in Finnish, since /v/ and /w/ are different phonemes in English, but allophones [v] and [w] in Finnish. The allophone [w] can occur in the word *sauva* [sauwa], but it is not considered a separate phoneme. Therefore, the influence of Finnish is likely to have played a part in the perception of these vowels in the English words of this study.

The difficulty concerning /v/ could also be explained in terms of different phonological maps and sound categories. We believe that the participants, when hearing the English voiced /v/ in its word context, could not differentiate it from its Finnish voiceless counterpart /ʋ/, or simply deemed it close enough to be the same phoneme. Again, the trend can be seen in how some of the children expressed the name of the letter before producing its sound ("that's <v>, /v/"). This agrees with Kuhl's (2000: 11855) NLM theory on how "one tends to hear sounds according to the pre-existing sound in their phonological maps". The finding also accords well with Best et al.'s (2001) theory of PAM, as it suggests that in the absence of a category for the new, non-native sound, it will be assimilated to an already existing L1 category. Whereas new sound categories would be easy to create for sounds that are clearly different from the sounds in one's L1, sounds that are very close to each other are harder to tell apart (Best et al. 2001). This is why the participating children could replace the rather similar sounding voiced /v/ with their voiceless phoneme /ʋ/, not realizing it is a different sound.

To conclude, most improvement in the production of initial sounds was found in the sounds /ʧ ʤ ʃ z/ and, on average, the development was the most significant in the Phonetic awareness group. When comparing the percentage of correct answers in the post-tests (see Table 9), the PA group's scores are highest in four out of six sounds, /ʧ ʤ z t/, and their development was statistically significant in the sounds /ʧ ʤ z ʃ/. There was a small difference between the results of the LS group and the CG, since in two out of six cases discussed above (/z s/) the Control group showed more development than the LS group, whereas with the rest of the sounds (/ʧ ʤ ʃ t/) the LS group was able to improve more. Surprisingly, the Control group had the largest percentage of correct answers with the phoneme /s/.

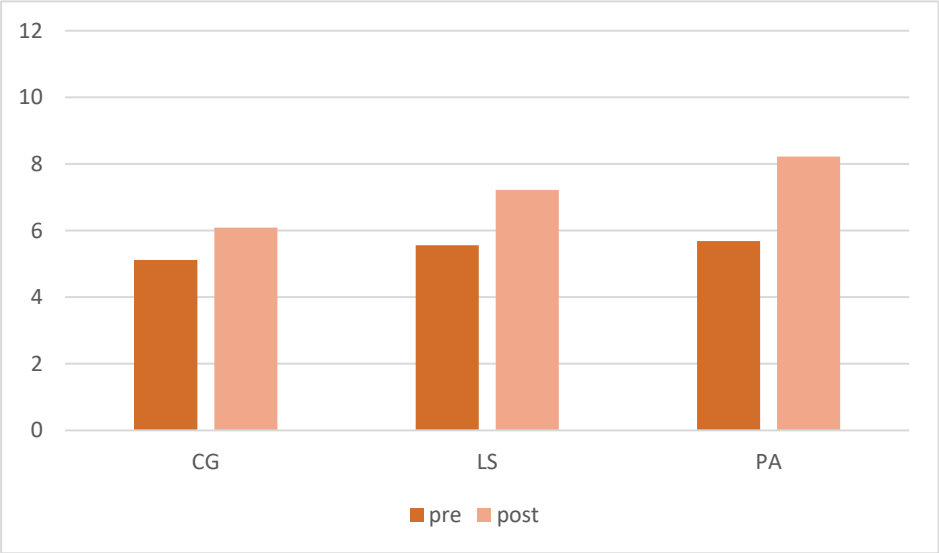
Overall, least change in the initial sounds was found in /t/ and /s/, as the groups scored high in these sounds already in the pre-test. This could be explained by these sounds' familiarity to the Finnish speakers. As for the sounds in which the groups' scores remained the lowest, only 36.7% of the children in the PA group (*n*=60), 29.6% of the LS group (*n*=27), and 18.2% of the participants in the CG (*n*=33) were able to produce the affricate /ʤ/ (see Table 9).

Table 9. Percentage of correct production of initial sounds in the three research groups

	PA		LS		CG	
	pre	post	pre	Post	pre	post
tʃ	38.3%	76.7%	37.0%	48.1%	36.4%	36.4%
dʒ	6.7%	36.7%	18.5%	29.6%	9.1%	18.2%
ʃ	38.3%	61.7%	33.3%	70.4%	27.3%	45.5%
z	38.3%	65.0%	37.0%	44.4%	21.2%	33.3%
t	85.0%	91.7%	63.0%	81.5%	78.8%	81.8%
s	73.3%	76.7%	74.1%	81.5%	78.8%	87.9%

In addition to looking at the studied initial sounds one by one, we can view the mean scores of all sounds calculated together as presented in Table 10. Here, the maximum score for all sounds combined was 12 points. These scores show that while there were no significant differences between the starting points of the groups, 5.68, 5.56, and 5.12 for PA, LS and CG, respectively, the post-tests yielded significant differences between the Phonetic awareness group and the Control group. The PA group received 8.22 points in the post-test, increasing their score by 2.54 points, while the CG remained at 6.09 points, increasing the score only by 0.97 points. The LS group performed slightly better than the CG, receiving 7.22 points, but it did not differ significantly from either of the other two groups. We can thus conclude that the increase in the mean scores overall was the most significant in the PA group.

Table 10. Each research group's total mean scores for initial sounds in pre- and post-tests



Thus, by examining these results, we are able to answer the first research question of this study; the production of English consonant sounds underwent the most significant change in the Phonetic awareness group, whereas the other two groups' production did not change significantly in a majority of the sounds. The good performance of the PA group could be expected, as the group participated in an intervention specifically focusing on phonetic awareness and pronunciation. The LS group was exposed to English sounds only through vocabulary learning, which means that they did not explicitly develop their phonetic awareness skills. The poorer results of the CG were also not surprising as this group had not been made sure to be exposed to English during the time between pre- and post-tests.

5.2 Final sounds

The results presented in this section will answer the second research question regarding change in the final sounds in the three research groups during the intervention period. As with the results of the initial sounds, the findings from the final sounds are grouped together based on patterns detected through statistical analysis. The sounds whose production underwent the most and the least development are grouped together, respectively.

5.2.1 Final sounds with the most change

Much like with the initial sounds, the pre- and post-test results for the final sounds showed that the most improvement occurred in the sibilants /z ʃ/ and the affricate tʃ/.

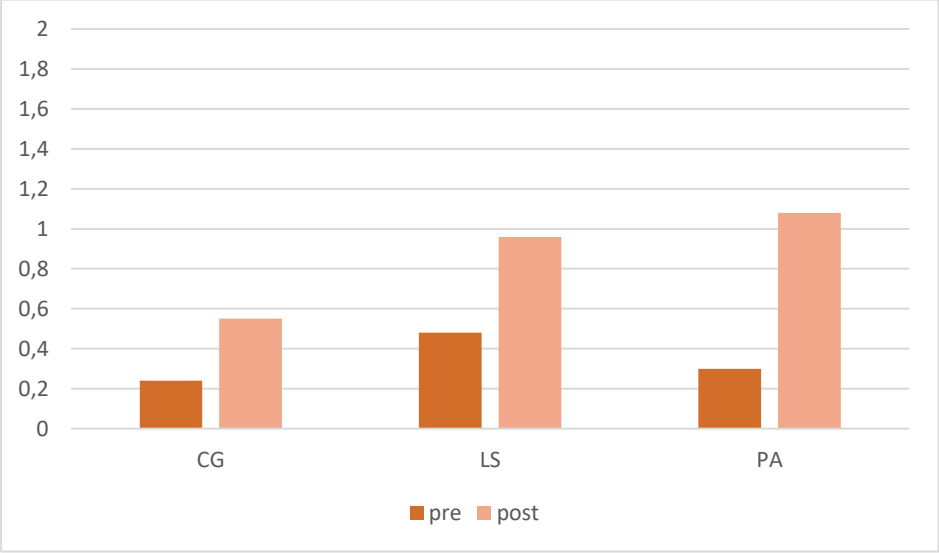
Voiced alveolar fricative /z/

The voiced fricative /z/ was the final sound in the word *freeze*. All three research groups showed significant improvement in their production of this sound, but the change was most impressive in the PA group, their pre-test mean score of 0.3 growing up to 1.08 in the post-test. This correlation was in this case very significant, $t(59)=-5.205$, $p<.001$. The LS group also reached a clearly higher score in post-testing, their mean score rising from 0.48 to 0.96. The improvement was clearly significant also in this group, $t(26)=-2.947$, $p=.007$. The CG had the lowest starting point of all the groups, with the mean score of only 0.24 in the pre-test, but was able to improve in the post-test reaching the mean score of 0.55. Even the results of the Control group, quite surprisingly, showed change of statistical significance, $t(32)=-2.390$, $p=.023$. The

improvement in the Control group is difficult to explain, since the children were not exposed to any official English teaching during the time between the pre-test and post-test.

Despite the fact that there was significant improvement in all groups, the level of competence in this sound was relatively low. Even in the Phonetic awareness group, that performed best in the post-test, only 53.3% of the participants (*n*=60) were able to recognize and produce the correct sound (see Table 16). The corresponding percentages were 48.1% for the LS group (*n*=27) and only 27.3% for the CG (*n*=33). This makes us wonder whether it is a matter of poor perception of the sound, or poor production skills of the correctly perceived sound. Finnish learners of English often fail to differentiate the strong fortis sound /s/ and the weaker lenis sound /z/, with problems in voicing and finding the correct friction noise (Morris-Wilson 1992: 71). Another confusing factor could also be the voicedness of the sound /z/ which is foreign to the Finnish language. The grapheme <z> does occur in Finnish loanwords, but its phonetic realization is often [ts] (Suomi et al. 2008: 37), like in *pizza* [pitsa].

Table 11. Mean scores in pre- and post-tests for all research groups: final sound /z/



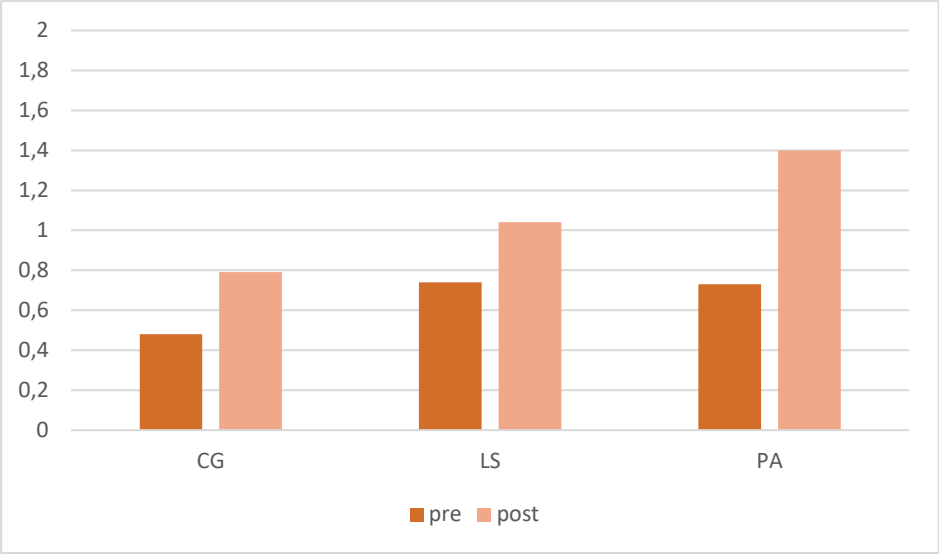
Voiceless postalveolar fricative /ʃ/

The voiceless fricative /ʃ/ was examined as the final sound of the word *wish*. Comparing the pre- and post-test results, the PA group's mean score nearly doubled, rising from 0.73 to 1.4 points, making the correlation very significant, *t*(59)= -4.764, p <.001. On the contrary, the improvement in both the LS and the Control group was not enough to be statistically significant,

t(26)= -1.280, p=.212 for the LS group and *t*(32)=-1.971, *p*=.057 for the Control group. The Language showering group scored 0.74 points in the pre-test and 1.04 in the post-test. The Control group's mean score rose from 0.48 to 0.79 points.

We can conclude that the Phonetic awareness intervention improved the participants' awareness of the sound /ʃ/ quite impressively, since 70% of the children (*n*=60) were able to produce the sound with accuracy after the intervention, compared to 36.7% in the pre-test (see Table 16). The improvement in the LS group (*n*=27) was more modest, with the percentage of correct answers growing from 37.0% in the pre-test to 51.9 % in the post-test. As for the Control group (*n*=33), 24.2% produced the correct sound in the pre-test and 39.4% in the post-test. The improvement detected in the PA group could mean that the children had become aware of this English phoneme and were thus able to produce it better in isolation. The sound is a strong, intense sibilant (Morris-Wilson 1992: 64), which can pose problems for Finns, who are used to having only one intense sibilant /s/ in their native tongue. As with many other fricatives, finding the correct quality for this sound can be difficult for Finns (Morris-Wilson 1992: 70).

Table 12. Mean scores in pre- and post-tests for all research groups: final sound /ʃ/



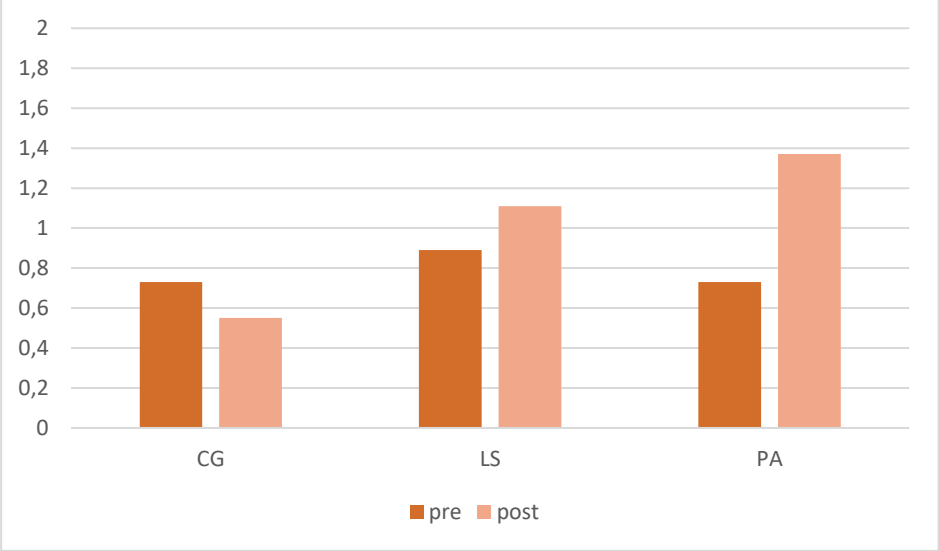
Voiceless palatal affricate /tʃ/

The voiceless palatal affricate /tʃ/ was the only affricate among the final sounds. The term affricate refers to a combination of a plosive and a fricative. Although affricates are written as two phonetic letters, they are one single sound. This affricate was tested in the context of the

word *such*. The participants in the two intervention groups, PA and LS, improved in their ability to produce the sound. The mean score of the PA group grew from 0.73 to 1.37 points, the improvement being statistically very significant, $t(59)=-4.324$, $p<.001$. In the pre-test, only 38.3% ($n=60$) of the children in the PA group were able to produce the correct sound, whereas in the post-test the percentage was 76.7% (see Table 16). In the LS group, however, there was no significant improvement, the mean score rising from 0.89 only to 1.11, $t(26)=-.827$, $p<.416$. Unlike the other two groups, the Control group failed to raise their mean score, which went from 0.73 points down to 0.55 points. This result might be illustrating the difficulty of this affricate sound for Finns. There are no affricates in the Finnish language, and the closest sound to this affricate would be the pronunciation of the Finnish letter z (/ts/) in words like *pizza* (Morris-Wilson: 98).

As this sound does not exist in Finnish, the children often substituted the unfamiliar affricate, /tʃ/, with the more familiar combination /ts/ or a sibilant like /s/. Since /ʃ/ is also quite unfamiliar to many Finns, this can lead to incorrect utterance of /tʃ/ as well (Morris-Wilson 1992: 98). During the Phonetic awareness intervention, the participants were familiarized with different English sibilant sounds and had the opportunity to include new sounds into their phonetic inventories. Perhaps because of this, the PA group had less interference from Finnish in the post-tests than the other groups, since nearly 77% of them could produce the sound with accuracy.

Table 13. Mean scores in pre- and post-tests for all research groups: final sound /tʃ/



5.2.2 Final sounds with little change

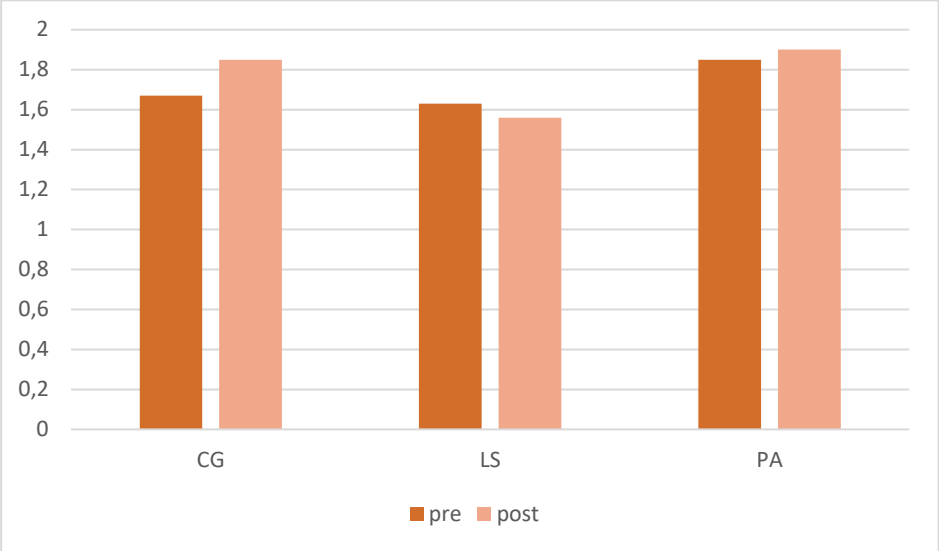
As with the initial sounds, the test results showed relatively little change in the sounds that are most familiar to the Finns, /t/ and /s/. Again, each group scored high already in the pre-test, and none of the groups were able to improve their performance significantly.

Voiceless alveolar plosive /t/

The voiceless plosive /t/ appeared as a final sound in the word *pet*. There was little change between the pre- and post-test mean scores in each group. In the PA group, the mean score went from 1.85 up to 1.9 points ($t(59)=-0.830$, $p=.410$). In the LS group, the post-test showed slightly poorer results, the mean score going from 1.63 down to 1.56 points ($t(26)=-0.386$, $p=.703$). In the CG, the correlation changed between 1.67 and 1.85 points ($t(32)=-1.789$, $p=.083$). As can be seen by looking at the large p-values, none of these changes, however, were statistically significant.

Following the trend of the perception and production of the initial /t/, this consonant was clearly easier for the children to recognize and produce than most of the other final sounds. The percentage of the participants who were awarded the full two points already in the pre-tests was 90% in the PA group ($n=60$), 77.8%. in the LS group ($n=27$), and 81.8% in the CP ($n=33$.) (see Table 16). Like discussed earlier, this high level of competence should not come as a surprise since the sound belongs to the Finnish language as well (although unaspirated). Rather, the fact that some children failed to recognize or produce this sound appears stranger to us. Their inability to recognize and produce this rather familiar phoneme could be due to misunderstandings with the task. In addition, some children could have confused the aspirated /t/ with other phonemes like /s/.

Table 14. Mean scores in pre- and post-tests for all research groups: final sound /t/

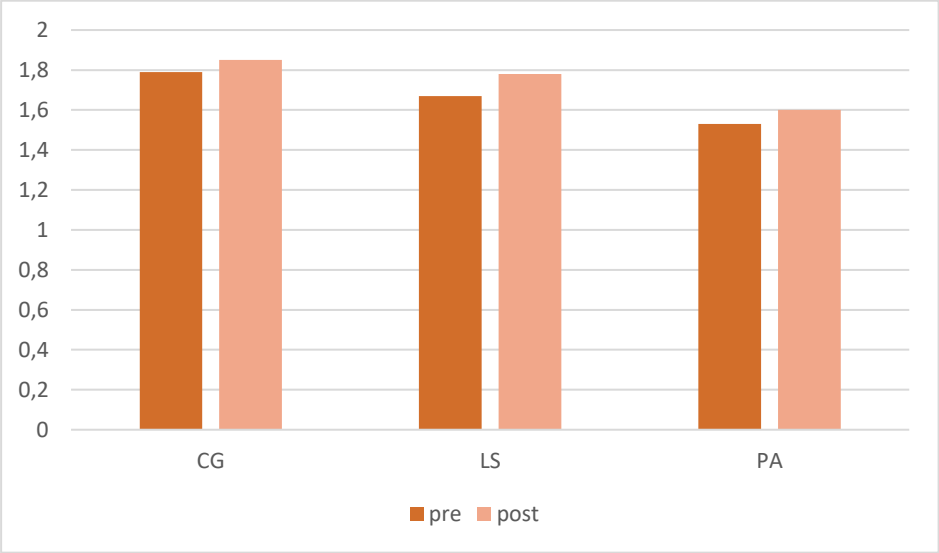


Voiceless alveolar fricative /s/

The sound /s/ was tested as a final sound in the word *mouse*. Similar to the initial /s/, all groups performed well already in the pre-tests. The change between the pre- and post-tests was, therefore, not great, and not statistically significant. The PA grew their mean score from 1.53 to 1.6 points ($t(59)=-0.475$, $p=.637$), the LS group from 1.67 to 1.78 points ($t(26)=-0.618$, $p=.542$), and the CG from 1.79 to 1.85 points ($t(32)=-0.466$, $p=.645$).

A good 84.8% of the children in the CG ($n=33$), 77.8% in the LS group ($n=27$) and 75.0% of the PA group ($n=60$) could recognize and produce the right sound (see Table 16). A similar phenomenon can be detected here as with the initial /s/. It is notable that the mean scores of the Phonetic awareness group were slightly lower than the other two. As we concluded earlier when considering the results of /s/ as an initial sound, the fact that this group had been introduced to a greater variety of sibilants might be the reason for slightly poorer perception of /s/. Although their phonetic awareness intervention could have raised their awareness of more sibilant sounds, it might not yet have been enough to help them in distinguishing the different kinds from each other with such great accuracy.

Table 15. Mean scores in pre- and post-tests for all research groups: final sound /s/



5.2.3 /θ/ and /v/ as final sounds

The sounds /θ/ and /v/ could not be included in the analysis, because some problems were encountered during the rating process. As discussed in section 5.1.3, the researchers could not come to an agreement when it came to rating the production of /θ/, /w/ and /v/ as initial sounds, and the same problem was encountered with the final sounds /θ/ (in *south*) and /v/ (in *gave*). As was the case with initial sounds, evaluating whether the final sound in *south* was /θ/, /f/ or perhaps /s/ was very challenging. The ratings could not be deemed reliable, because so much guesswork was involved. Again, the fact that there is such an acoustic similarity between /f/ and /θ/ made it very difficult to decipher which sound a participant uttered. In addition, the children often produced the sounds with a weak voice, which made it difficult to tell fricative sounds apart.

As for the labiodental /v/, the sound was often confused with the approximate /w/ or the labiodental /f/. Although /w/ does not occur word-finally in English, and it would, thus, be inacceptable in *gave*, some children still produced /w/ probably as they were unable to produce the correct sound /v/. The conflation of /f/ and /v/ is quite logical, since this phoneme pair is one of the four voiced-voiceless fricative pairs in English (Ogden 2009: 118). When the children could not produce the correct voicing for /v/, the resulting sound turned out to be /f/.

To conclude, in the final sounds, all three research groups had significant improvement in the voiced sibilant /z/, as presented in the Table 16 that shows the percentage of correct answers each research group received in each final consonant (excluding the sounds /θ v/). However, the phoneme /z/ could still be considered difficult for the participants, since the number of correct answers was the lowest of all the sounds. The percentage of correct answers for this sound was 53.3% (*n*=60) for the PA group and a little less impressive 48.1% (*n*=27) for the LS group. As for the Control group, equally low percentage was detected with /z/ and /tʃ/, only 27.3% of the group members (*n*=33) being able to produce the correct sounds. The PA group's development was statistically significant also in the fricative /ʃ/ and the affricate /tʃ/.

The least development in all groups was detected with the sounds that could be considered familiar to Finnish-speakers, /t/ and /s/. Interestingly enough, the PA group that performed better in most sounds, had lower scores regarding the familiar sibilant /s/. As mentioned earlier, one possible explanation for this phenomenon could be that their becoming aware of the different sibilant sounds, such as /ʃ/ and /z/, in their phonetic awareness intervention might have given the children more fricative options to choose from, which might have caused some confusion.

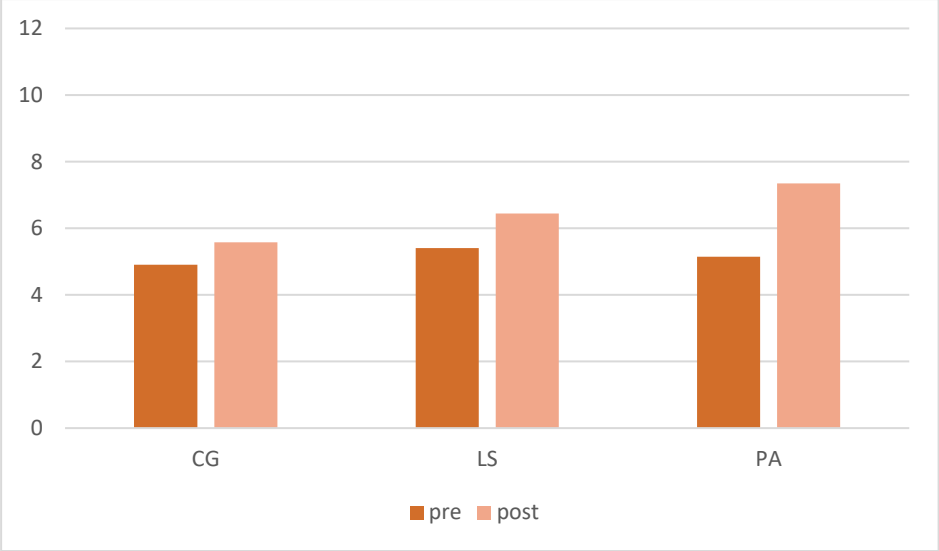
Table 16. Percentage of correct production of final sounds in the three research groups

	PA		**LS**		**CG**	
	pre	**post**	**pre**	**post**	**pre**	**post**
tʃ	38.3%	76.7%	37.0%	48.1%	36.4%	36.4%
ʃ	36.7%	70.0%	37.0%	51.9 %	24.2%	39.4%
z	15.0%	53.3%	22.2%	48.1%	12.1%	27.3%
t	90.0%	93.3%	77.8%	77.8%	81.8%	90.0%
s	75.0%	78.3%	77.8%	88.9%	84.8%	90.0%

While previously the mean scores for each sound were discussed individually, Table 17 presents the mean scores for all sounds calculated together. The mean scores of each research group further demonstrate how the PA group was able to improve their scores the most. Just like with the initial sounds, the differences in the post-test scores were not significant between the PA group and the LS group, nor the LS group and the CG, however, the results were significant

between the PA group and the CG. Again, the groups had very similar results in the pre-tests before the intervention periods, whereas in the post-test the PA group's scores had clearly increased more than the other groups. In the pre-test, the scores were 5.15, 5.41 and 4.91 for PA, LS and CG, respectively. In the post-test, the mean score of the CG remained below 6 points (5.58), whereas the LS group received 6.44 points, and the PA group 7.35 points. Thus, the PA group's score grew by 2.2 points, the LS group's only by 1.03 and the Control group's by 0.67 points.

Table 17. Each research group's total mean scores for final sounds in pre- and post-tests



To answer the second research question of the study, although all groups showed improvement in most of the sounds, the production of the English final consonants was found to have improved most significantly in the Phonetic awareness group, and least in the Control group. All in all, the results for both initial and final sounds were rather similar. In other words, the phonemes whose production developed the most in both cases were affricates and fricatives. What is more, the PA group outperformed the other groups in most of the studied sounds. As mentioned before, this trend could be expected and the results explained by the teaching interventions applied in the study.

6 DISCUSSION

The goal of this experimental study was to test the effect of two different teaching interventions on the English consonant production skills of Finnish-speaking second-graders. We examined to what degree the participating children were able to produce English initial and final consonant sounds before and after an eight-week intervention period. The two teaching interventions that were conducted during the research period were the Phonetic awareness intervention and the Language showering intervention. The Phonetic awareness intervention group received English teaching that focused on learning English sounds as well as some vocabulary and short phrases in a fun, playful way. The Language showering group was also introduced to English vocabulary and short phrases, however, without any emphasis on phonetics or single sounds. In addition, to prove the effect of the interventions, a Control group that received no English teaching was also included in the study. Since the goal was to test the effectivity of the teaching interventions, the two research questions were formulated in the following way:

1. How did the production of English initial sounds change during the intervention period in three research groups?
2. How did the production of English final sounds change during the intervention period in three research groups?

The recent, earlier FLL initiative in the Finnish foreign language teaching curriculum was the motivation for this research project. The present study utilized data collected as a part of a larger research project called *Kielitaito kuuluu kaikille* by Niilo Mäki Institute, focusing on developing and testing young children's phonological awareness skills. The original research project included children from grades where English is not yet systematically taught, that is, from pre-school level up to second-graders, whereas the present study focused solely on second-graders, i.e. seven to eight-year-old children. As the aim of the project was to test the effectiveness of phonetic awareness instruction, the participants (N=120) were tested by using a segmenting task that would reveal how accurately they can separate initial and final sounds from short words.

The results indicate that the children who participated in the Phonetic awareness intervention had improved their consonant production skills significantly with various consonant sounds. The initial sounds whose production underwent the greatest change were the voiceless palatal

affricate /tʃ/, the voiced palatal affricate /dʒ/, the voiceless postalveolar fricative /ʃ/ and the voiced alveolar fricative /z/. In the PA group, the increase in the mean scores for all four sounds was statistically significant. In the case of the two initial affricate sounds and the fricative /z/, the PA group's results were clearly the strongest, however, with /ʃ/ the LS group had very similar results to those of the PA group. That is, in three out of four cases the PA group had increased their score the most, while there was no significant change in the other groups. When comparing the total mean scores of each group, we can conclude that the PA group increased their overall score in the initial sounds the most, by 2.54 points. By comparison, the LS group improved their score by 1.66 points, whereas the Control group's score went up by 0.97 points.

As for the final sounds, the most significant increase in the mean scores was detected with the sounds /z ʃ tʃ/. The results of the production of the phoneme /z/ are quite surprising, since there was statistically significant increase in all three groups' performance. This could be explained by the fact that in the post-tests, the participants had, perhaps, grasped the idea of the test better which could have led to better performances. However, the PA group still reached the highest score in the post-test with /z/. The Phonetic awareness group's scores were also the highest with the sounds /ʃ tʃ/, and there was no statistically significant increase in the results of the two other groups. Interestingly, the mean score of every final sound increased in all three research groups, with the exception of /t/ in the LS group and /tʃ/ in the CG. All in all, these were the only two cases in the whole test where the mean score was lower in the post-test than in the pre-test. We could speculate that segmenting final FL sounds is slightly more difficult than segmenting initial sounds. In fact, the total mean scores were lower for the final sounds than for the initial sounds in the pre-test as well as in the post-test. In other words, fewer points were rewarded for the segmenting task in final sounds, which is to say that the level of proficiency was lower in final sounds.

The teaching interventions did not seem to have a significant effect on the production of the already quite familiar sounds /t/ and /s/, as each group scored high already in the pre-tests. This phenomenon was detected with both initial and final sounds, and no significant differences between the groups were found in either case. All in all, the findings of this study are in line with previous research. As reported by Lintunen (2014), Tergujeff (2013) and Morris-Wilson (1992), the most difficult sounds for Finns tend to be affricates, sibilants and dental fricatives. In this study, the lowest percentage of correct answers – even in the post-tests of the PA group – was detected with the sounds /z tʃ dʒ/ and /ʃ/.

Although the results of this experimental study seem to point to a promising effect of a short-term training of phonetics, there are a number of factors that could have affected the outcome of this study. First, as explained in section 5.1.3, some of the sounds chosen for the tests were difficult to hear and differentiate by ear. These issues were encountered with the three sounds /θ w v/ which were consequently excluded from the more detailed analysis. One reason that explains the difficulty is that it turned out to be nearly impossible to tell whether someone is uttering /θ/ or /f/, especially based on the consonant sound alone, that is, without any word context. Perhaps the phonemes would have been easier to recognize in CV or VC contexts. Now, the production of a CV or VC combination resulted in a rating of zero, so the results could have been different if those combinations were accepted. Anticipatory coarticulation or speech planning may have paid a role in some of the productions of the initial sounds that were deemed incorrect, since some children included the following vowel as part of their consonant. However, it is debatable to what extent producing a CV combination shows consonant segmenting skills, since the point is to separate a single sound. In addition, such CV approach could have been confusing for the children.

Second, the procedure of the study sessions could have played a role in the final results of the test. As a reminder, the method chosen for the study was the following: the researcher uttered a word aloud and the child said the initial or final sound of that word out loud. On the one hand, this could have made the participants feel more at ease, because it was the researcher who spoke the word instead of an unfamiliar voice from a recording. On the other hand, there were multiple research assistants involved in the study process, because the data was collected on two occasions, in 2017 and 2018. Thus, there was no consistency in the production of the model words, since each research assistant had his or her own personal way of pronouncing them. If the words had been recorded in advance and the same recording had been played in each study session, each child would have had the same pronunciation model.

There is another, perhaps a minor detail of the study design that could have affected the final results of the study. All of the sounds that were measured in the test did not have a corresponding letter. That is to say, some sounds like /s/ and /t/ had a corresponding letter that the participants could say to indicate that they had perceived the correct sound. If a child said "It is *tee*" when they were supposed to say the individual phoneme, he or she was rewarded with one point. However, sounds like /tʃ/ or /dʒ/ could not be expressed as a letter that worth

one point. Thus, for these sounds it was impossible to have one point, so the rating system of zero, one or two points cannot be considered universal.

Our results seem to strongly suggest that there had been development in the Phonetic awareness participants' awareness for phonetic content. The Phonetic awareness group's total mean scores increased the most both with the initial and final sounds. In addition to becoming aware of the differences between the particular English consonant sounds, the children also seemed to have gained better segmenting skills that allowed them to hear sound borders in words. All this can be seen to have resulted in better performance in their production of the correct sounds in the post test situation. Therefore, we can assume that becoming more phonetically aware has a direct connection to one's performance in sound discrimination, which can lead to more accurate sound production. What is more, being exposed to mere language showering, lacking the attention to phonetic details, proved to be less effective than receiving phonetic awareness teaching. That is not to say that language showering would not benefit young language learners in any way. Since the goals of the two interventions were different, we believe that the participants of the LS group learned new vocabulary and phrases but not phoneme segmenting. However, even in the segmenting test we could detect clear trends of development also with the LS group, but often without statistical significance.

Nevertheless, as promising as these results may appear, this study did not measure what the children had learned, rather the segmenting task simply put the participants' phonetic awareness to the test. In other words, the tests measured how well the children could separate the initial or final sound from a word context and produce the correct sound. Even when a child is able to utter a particular sound accurately, it does not necessarily mean that he or she has the sound in his or her active phoneme inventory, ready to be utilized in any given word context. It can simply mean that the child knows where one sound ends and where the next one begins, and is able to imitate the sound he or she heard in the word. So even if the children might be able to mimic a sound, it does not tell anything about their skills in phoneme-grapheme relations, i.e. their interpretation or recognition of those sounds in written form. Since the goal of this study was to measure the development of phonological awareness, measuring deeper, long-term learning was not considered here. If this type of phonetic awareness training does not guarantee the learning and memorizing of new foreign language sounds, it can, however, help shape learners' phoneme inventories. As discussed in section 2.1, learning a new language requires some changes to be made in the learner's phonetic map. The phoneme inventory of one's

mother tongue needs to, therefore, be complemented by the sounds of the new language. In other words, training phonetic awareness is generally beneficial for learning new phonetic systems.

Another matter to consider when interpreting the results of this study is the interconnection between perception and production of foreign language sounds. It is possible that some participants could have perceived a correct sound but were unable to produce it, because the foreign sound was not part of their inventory. As was discussed in section 3.3.2, it is commonly thought that one must be able to perceive a sound before it can be produced. Otherwise, the sound can be categorized as nonspeech and ignored completely. As the perception skills of the children were controlled only in the warm-up whole-class exercise of this study (see Sample 1), but not analyzed or compared to individual children's production skills, we cannot make any further conclusions about the relationship between their production and perception abilities. In other words, if a child was unable to produce the correct sound, we would not be sure whether this was because the child could not differentiate the sound from a Finnish, relatively approximate sound or because he or she could not produce the English equivalent even if he or she recognized the English sound.

Perhaps the most interesting implication of the results of this study is the fact that even a short-term teaching intervention can have a positive influence on children's phonetic skills. This finding should encourage teachers to bring even small amounts of phonetic training into the language classroom. The Phonetic awareness intervention was conducted in only eight 45-minute sessions, and still the increase in the group's mean scores was statistically significant. We would suggest that teachers focus on the phoneme pairs with the highest functional load, i.e. those that are often conflated and cause issues in communication. We cannot, however, guarantee long-term results, since these findings are based on a purely singular experimental study. To test whether a short-term teaching intervention could have more lasting results on children's awareness of English consonants, we would require evidence from a longitudinal study. Another test session should be organized, for instance, some months or years after the intervention period. Ultimately, it would be worth examining whether an early start to FLL can really make a difference on children's permanent phonetic learning even in a formal school context. In other words, it would be interesting to know whether children who started learning a foreign language earlier in school have better ultimate attainment of the language.

The present study has demonstrated that studying consonant phonemes in an explicit way can improve learners' perception and production of them. Needless to say, being aware of the different sounds and being able to produce them both contribute to better one's pronunciation as well as understanding of a foreign language. We can, therefore, encourage language teachers to introduce phonetic teaching to their classes even with young FLL learners, such as second-graders, who were in the center of this study. However, as obvious as the relationship between phonological training and success in FLL pronunciation may seem, it would be interesting to study the different factors that affect a child's phonological learning in an FL. There are individual differences in phonetic learning, which means that there can be innate factors that facilitate the development of phonological awareness and adaptability to new phonetic items. In other words, it would be intriguing to study the innateness of phonological awareness and the influence that training can have on it.

Although this study focused on learning single phonemes, we acknowledge that other types of phonological training aiming to improve learners' pronunciation could be equally useful for learners. Similar experimental studies could be conducted from the point of view of prosodic features to learn whether a short-term intervention can improve learners' proficiency in, for instance, intonation in the target language. This study, although experimental, has proven the effect of conscious training in learning new phonetic content, and can, thus, work as a basis for new research in the field. As a final note, we must consider teacher proficiency in teaching phonetics. FL teachers should have adequate linguistic and pedagogical proficiency in order to make the most out of an early start to foreign language learning. Taking advantage of children's sensitivity to adapting to new phonetic systems requires the right techniques and materials. Thus, teacher training should focus more on the pedagogy behind teaching pronunciation, and language textbooks should encourage learners to develop their phonological awareness skills.

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APPENDICES

Appendix 1. Individual test sheet (Finnish)

AM	LM

Nimi: _____

Nyt tehdään samankaltaisia tehtäviä, kuin tehtiin luokassa yhdessä. Nyt sinun ei tarvitse rastittaa mitään, riittää että vastaat suullisesti minulle. Näiden tehtävien tekemiseen ei mene kauaa, sitten pääset takaisin luokkaan. Taas riittää, että teet vain parhaasi, näitä ei tarvitse osata kaikkia, koska ette ole vielä (kovin paljoa) opiskelleet englantia.

Ensimmäisessä tehtävässä sanon sinulle sanan, ja sinä saat sanoa minulle, mikä on se sanan ensimmäinen äänne. Esimerkiksi, jos sanon sanan Keppi, mikä on sen alkuäänne? Hyvä, juuri niin, /k/. (Jos lapsi ei osaa, kerrotaan vastaus auttaen ensin ja kysytään toinen: mikä on sanan Peli ensimmäinen äänne? Autetaan niin, että lapsi ymmärtää mikä on alkuäänne).

Nyt aloitetaan. Voin sanoa sanan sinulle kaksi kertaa. Jos et millään tiedä vastausta, voit arvata jotain.

- ☐ tin
- ☐ third
- ☐ salt
- ☐ zombi
- ☐ shave
- ☐ chimp
- ☐ job
- ☐ will
- ☐ very

Hienoa! Nyt tehdään samalla tavalla, mutta kerro minulle LOPPUÄÄNNE, eli se äänne, mihin sana loppuu. Jos vaikka sanoisin sinulle sanan Hypyt, viimeinen äänne olisi… (oppilaalle voi antaa hetken aikaa hakea oikeaa vastausta, kerro sitten vastaus) kyllä, /t/.

- ☐ pet
- ☐ south
- ☐ mouse
- ☐ wish
- ☐ such
- ☐ freeze
- ☐ gave

Appendix 2. Individual test sheet (English)

PRE POST

Name: _____

Now we are going to do similar exercises to the ones we did in the classroom together. This time you don't need to check any boxes, and it's enough that you answer me orally. It doesn't take long to do these exercises, and you will get back to the classroom right after. Again it's enough that you do your best, and you don't have to know all the answers since you haven't yet been learning English (a lot).

In the first exercise I'll say a word to you, and you get to tell me what the first sound in that word is. For example, if I said the word Keppi, what would the first sound in it be? Yes, that's right, /k/. (If the child cannot answer the question, help and work together to reach the answer, and then ask another: what is the first sound in the word Peli? Help so that the child understands what a first sound is.)

Now, let's begin. I can say each word twice. If you really don't know the answer, you can guess something.

- ☐ tin
- ☐ third
- ☐ salt
- ☐ zombi
- ☐ shave
- ☐ chimp
- ☐ job
- ☐ will
- ☐ very

Well done! Now we'll do the same, except that you should tell me the FINAL SOUND, the sound the word ends with. If, for example, I said the word Hypyt, the last sound would be… (you may give a moment for the pupil to think about the answer, then tell the answer) yes, /t/.

- ☐ pet
- ☐ south
- ☐ mouse
- ☐ wish
- ☐ such
- ☐ freeze
- ☐ gave