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READING SKILLS AND FL ACQUISITION
IN DYSLEXIA: A CASE STUDY
Master's Thesis

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ABSTRACT

This thesis examines how dyslexia affects foreign language acquisition and takes into account the effects of foreign language acquisition on the skills in the first language. The role of dyslexia and its influence on reading and writing skills is examined here through a series of premeditated tasks, aimed at proving that a child with dyslexia would rely more on their phonological memory due to their lack of phonological processing ability. The study also brings forth the relationship between the student and the teacher, and examines how this relationship and collaboration affect the teaching process. Furthermore, the thesis also offers a brief overview of the most important theories in first and second language acquisition and discusses orthographic differences in various languages and their influence on acquiring language in its written form.

Key words: dyslexia, language acquisition, foreign language, phonological processing, phonological memory, orthographical awareness

1. INTRODUCTION

Good education is an important factor in achieving a successful and happy life. Ever since elementary school, children are frequently judged based on their academic achievement, and children who lag behind are mostly regarded as lazy, especially in lower levels of elementary education. This perception of children as lazy particularly comes in focus in language classes where children are expected to read fluently and write correctly in their second or third year of schooling. Many teachers and parents feel as if their children simply do not try hard enough if they fail to achieve the desired level of literacy. However, contemporary research (Benton 1980; Brown 2000; Nijakowska 2010; Sparks 2006) has shown that there is a number of language impairments, which impede children from successfully acquiring language, whether in its written or oral form. Since most learning difficulties are recognized based on a child's unskilled reading, this thesis will focus on a specific language learning impairment, or rather a reading impairment, called dyslexia.

Although many people wrongly assume that dyslexia is the only type of reading impairment, there are in fact several types, and each reading impairment shows different manifestations and effects on the child's language acquisition. One of the main causes for this is the fact that there is no unique, research-based definition of dyslexia, hence many children are categorized as dyslexic even though they do not have this specific reading impairment. A historical overview as well as the current definitions of dyslexia and tendencies in research will be provided in Chapter 3 of this thesis.

In order to understand language development, this thesis will offer a short overview of language learning theories. Croatian educational environment is quite specific given that children start learning English in their first grade and most of them opt for another language in their fourth grade, namely German (110 434 pupils) or Italian (26 424 pupils)¹. In this case study, L2 (second language) is English and L3 (third language) is German. Considering the fact that Croatian, English and German have a number of differences between each other, Chapter 2 also offers a description of differences in orthographies of these three languages and explains the role of orthography in acquiring a language.

The research consists of several tasks regarding reading, and phonological and orthographical awareness, but it will not be presented in a classical manner since the purpose

¹ Croatian Bureau of Statistic (Zagreb), First Release, Number 8.1.2. Basic schools (27.4.2012.), ISSN 1330-0350, item 1.5. http://www.dzs.hr/Hrv_Eng/publication/2012/08-01-02_01_2012.htm

of this thesis is to show how both the child and the teacher work together in order to successfully overcome the difficulties present. Furthermore, the research gives insight into the psychological aspect of this type of learning and teaching.

2. LANGUAGE ACQUISITION

Language as a means of communication is characteristic solely to the human race. The way in which language is acquired has been attracting the attention of psychologists and linguists for a long while and their interest and research has resulted in several different theories. Among the most important ones, there are the behaviourist perspective, the nativist perspective and the interactionist/developmental perspectives, which, as their names suggest, all have a different perspective on what it is that generates language.

Behaviourism is a theory of learning developed in the 1940s and 1950s in the USA under the influence of the psychologist B. F. Skinner. Behaviourists suggested that language is acquired just as any other skill – through observation and imitation – and that it is a mere behaviour. They believed that any behaviour could be modified using ‘positive’ and ‘negative reinforcement’. ‘Negative reinforcement’ can be envisioned as a type of punishment which serves to show that certain behaviour is not accepted. ‘Positive reinforcement’, on the other hand, is a type of reward that serves as encouragement for certain behaviour to continue. (Tahriri 2012: 3) In case of language acquisition, ‘positive reinforcement’ is the child’s ability to communicate successfully. For example, if the child successfully communicates that he/she is hungry, the parents will feed him/her and this will serve as a reward, hence encouraging the child to communicate again. Lightbown and Spada note that:

“Thus encouraged by their environment, children would continue to imitate and practise these sounds and patterns until they formed ‘habits’ of correct language use. [...] the quality and quantity of the language the child hears, as well as the consistency of the reinforcement offered by others in the environment, would shape the child’s language behaviour.”
(Lightbown, Spada 2006: 10)

As it can be noted, this theory places great emphasis on the environment as the source of everything necessary for a child to acquire language. The behaviourists take into consideration only the observable behaviour (i.e. what the child actually utters), while simultaneously ignoring the human mind because, in their point of view, it cannot be analysed objectively. Hence, their theory does not explain the appearance of complex syntactic structures and utterances which have never been heard before. Although behaviourism offers certain insight

into how language is acquired, Reynolds and Flagg, (1983) note that children's speech is not mere repetition of adults' utterances, but rather a complex process of picking up patterns, making generalizations and creating new words.

The first ones to take into consideration these complex structures and new utterances are the nativists led by the linguist Noam Chomsky. Chomsky challenged the behaviourist claims by arguing that “children are biologically programmed for language and that language develops in the child in just the same way that other biological functions develop.” (Lightbown, Spada 2006: 15). According to Chomsky (1965), language capacity is innate. Furthermore, he claims that there is a universal mechanism underlying all human languages:

“Languages, therefore, resemble men in this respect, that, though each has peculiarities, whereby it is distinguished from every other, yet all have certain qualities in common. The peculiarities of individual tongues are explained in their respective grammars and dictionaries. Those things, that all languages have in common, or that are necessary to every language, are treated of in a science, which some have called Universal or Philosophical grammar.” (Chomsky 1965: 5)

He hypothesizes that all humans have a Language Acquisition Device (LAD) – a module in our minds equipped with basic principles of all languages – which enables us to make hypotheses about how language system works and helps us acquire language despite the limited amount of input. His theory is often linked and further supported by the Critical Period Hypothesis (CPH) which states that “[...] animals, including humans, are genetically programmed to acquire certain kinds of knowledge and skill at specific times in life. Beyond those ‘critical periods’, it is either difficult or impossible to acquire those skills.” (Lightbown, Spada 2006: 17) Although CPH in its definition regards various skills, most linguists and psychologists agree that it is a good explanation of how languages are acquired at an early age. However, it remains unclear whether it is possible to acquire language without being exposed to it during this period and the research that could confirm or reject this would require a complete isolation of a child. Due to their cruelty, these research are not conducted so the scientists base their conclusion on several cases of “wild children” – children found in the woods living with animals or children who were isolated by their own families. The first documented case is that of a boy named Victor that dates back to the 18th century. Victor was found in the woods at the age of 12 and even though he received proper care and education, he did not accomplish to acquire language. Lane

(1976) noted that perhaps the problem was in the teacher – Jean-Marc-Gaspard-Itard, a young physician who took care of Victor – and his wrong approach to the boy:

“[Itard’s] conditioning technique had enough flaws so that we cannot know if Victor might not have been able to recover speech, and go to greater development in language, thought, and social life. [...] In attempting to teach Victor to discriminate speech sounds, Itard began with too many vowels. [...] he made his selection based on the alphabet, rather than on available differences, and he failed to use his own principle of dwindling contrasts.”
(Lane: 1976, p. 169)

In the 20th century, the linguist Susan Curtiss discovered and treated a girl called Genie. The case of Genie is probably one of the most traumatic cases psychologists and linguists have ever encountered. Genie was a thirteen-year-old girl discovered in California who had spent all her life isolated, abused and neglected. Her father had forbidden her mother and her brother to speak to Genie so the girl spent 11 years in complete silence. After she was discovered, Genie received numerous help and care from teachers and therapists, but her language acquisition failed. (Curtiss 1977) Given that there are medical recordings of Genie’s first two years which show no physical or intellectual faults, researchers concluded that this case could serve as a firm proof of the CPH. Nevertheless, once again the question of physical abuse and brain injuries arises and no definite conclusions can be reached.

Several other cases of “wild children” have been documented, but these children managed to acquire language to some level. However, it remains unclear at what age they had been deprived of the human contact and these cases cannot serve as firm evidence of the CPH. Their inability to reach certain level of language does confirm the CPH, but they did manage to acquire some parts of language which can either mean that the CPH is not applicable to language or that they had been exposed to language prior to their disappearances. Furthermore, it is possible that they had sustained brain traumas, which would then prevent them from successful language acquisition regardless of the input and age.

We have seen that the behaviourists and the nativists have a rather different perception of what it is that affects language acquisition and both have some undoubtedly valid points, thus it is not a surprise that the third major theory combines these two perspectives. The interactionist or developmental theory of language acquisition arose from the cognitive approach to linguistic and its main claim is that the human brain has a remarkable capacity of acquiring language and that this capacity will verify – or rather, the child will learn a language

– if in the child’s environment there is enough exposure to that language. The interactionist hypothesis states that:

“language acquisition is based both on learners' innate abilities and on opportunities to engage in conversations, often those in which other speakers modify their speech and their interaction patterns to match the learners' communication requirements.” (Lightbown, Spada: 2006. p.201)

Cognitive and developmental psycholinguists argue that the nativist perspective puts too much emphasis on the final result – a fluent adult language speaker – and too little on what happens in the process. The two main representatives of this theory are Jean Piaget and Lev Vygotsky who, respectively, have different, but cognitively based theories on language acquisition. Piaget believed that language is a cognitive ability and that it cannot develop prior to the cognitive development of a child. He found the evidence for his theory in the fact that the child is able to express linguistically only what he or she understands cognitively – for example, the use of words ‘more’ and ‘less’ depends on the child’s ability to grasp the concept these words represent. (Piaget 1959) Vygotsky, on the contrary, argued that there is an interplay between language and reality:

“Piaget argues that "things do not shape a child's mind." But we have seen that in real situations when the egocentric speech of a child is connected with his practical activity, things do shape his mind. Here, by "things" we mean reality, neither as passively reflected in the child's perception nor as abstractly contemplated, but reality that a child encounters in his practical activity.” (Vygotsky 1986: 39-40)

Moreover, he claimed that children are able to proceed or advance to a higher level of knowledge and performance precisely through meaningful social interaction with adults and other children. He envisioned this interaction as a metaphorical space in which children were able to do more than they would be able to do on their own. This “space” is seen as their Zone of Proximal Development - “the distance between the actual development level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peer” (Vygotsky 1978: 89).

Despite the different perspectives, all psychologists and linguists agree that acquiring language is a fascinating skill. There is a mutual conclusion that the acquisition of first language happens in a highly similar way in children across the world – through developmental

sequences. For instance, one characteristic of children's language is 'telegraphic' speech in which children omit function words and grammatical morphemes, but they are still able to communicate and clearly express themselves. These developmental sequences are seen as 'stages' through which the child progresses and they are to some extent related to the child's cognitive development. For example, the child will not use adverbs of time such as tomorrow or yesterday until they have developed some understanding of time. On the other hand, children can distinguish between singular and plural long before they acquire the grammatical morphemes to express this. (Lightbown, Spada 2006: 2) Although there are differences between languages, researchers agree that the child's ability and fluency in their first language has a direct influence on their second or foreign language acquisition. Any disorders or impairments in native language will hence be present in the foreign or second language.

"It has been shown that the performance on standard measures of native language skill is related to the level of foreign language proficiency. Namely, higher levels of oral and written foreign language proficiency are achieved by the students who exhibit higher levels of native language skills. Thus, difficulties in reading, writing, listening and speaking, be they subtle or overt, existing in the native language are likely to be responsible for similar difficulties in foreign language learning. [...] Suffice it to say that poor native language skills may significantly impede the process of foreign language learning." (Nijakowska 2010: vii-viii)

2.1. FOREIGN LANGUAGE LEARNING THEORIES

Different perspectives on first language acquisition exhibit substantial influence on second and foreign language learning theories so once again it can be said that there are three major perspectives on the acquisition of a FL. However, before a brief overview of the theories, the difference between second and foreign language has to be explained. Although sometimes these terms are used interchangeably, many authors (e.g. Nijakowska 2004; Jelaska 2005) believe that there is in fact a substantial difference between a second and a foreign language. According to them, second language is the language taught in a country where that language is in use and is often acquired in a community through formal and informal everyday communication (e.g. English as the second language in Canada), whereas foreign language is mostly defined as a language different from the native language that is taught formally in schools by strict and regulated programmes (Medved Krajnović 2010: 2-6). Still, the same author concludes that it is exceptionally hard to establish a boundary between a second and a foreign language in

contemporary society, especially for the English language. (Medved Krajnović 2010, p.5) Linguists have deemed English the only *superposed-language* since it is the language with the highest number of overall estimated speakers (native and non-native) all around the world. As it can be seen in Figure 1, English has only 400 million speakers more than Chinese, but Chinese has an extremely high rate of native speakers, while three quarters of the speakers of English are non-native speakers. However, it is necessary to understand that this figure is calculated based on approximation.

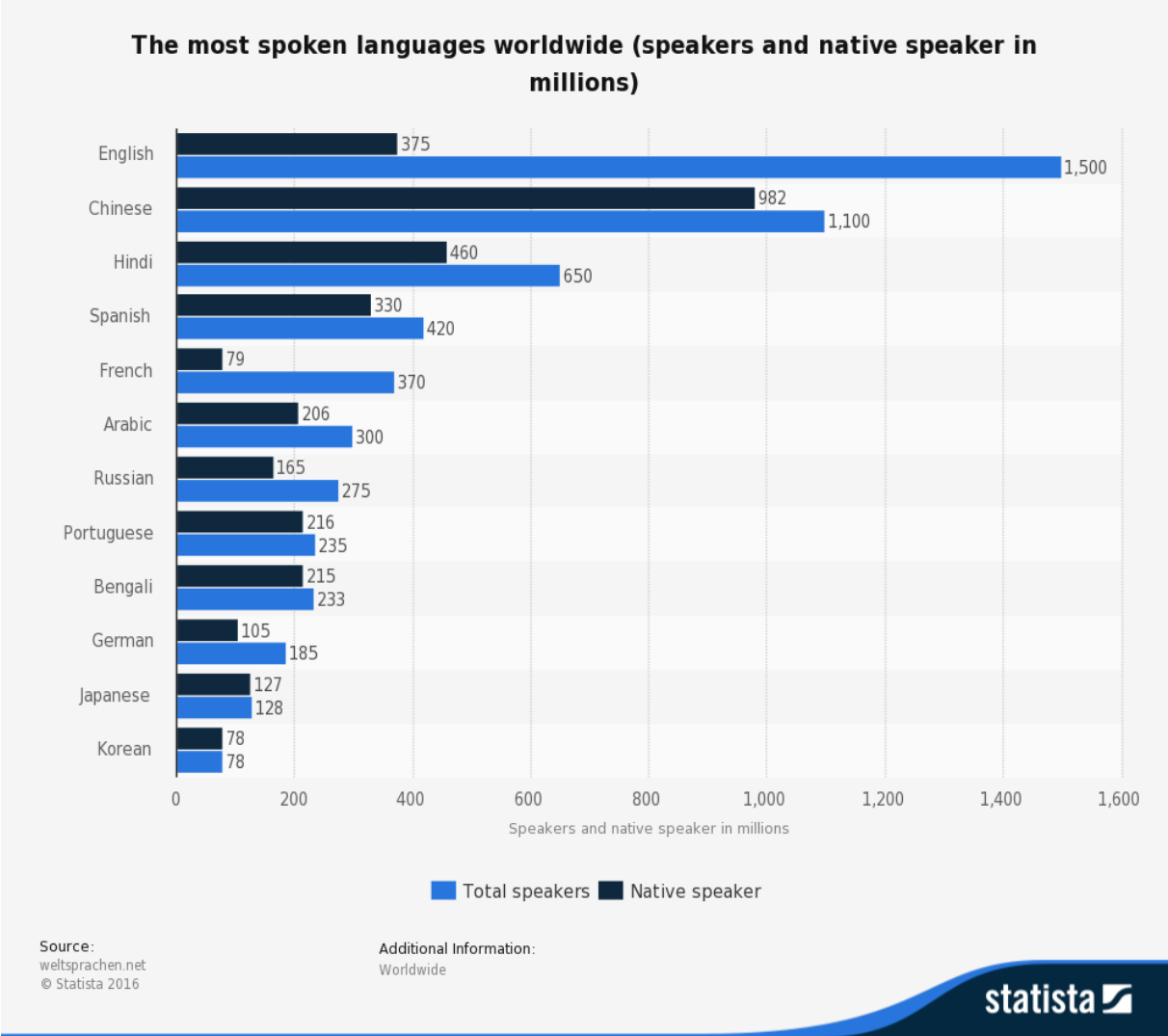


Figure 1. The most spoken languages worldwide

Due to this high number of non-native speakers of English, it does not surprise that it is considered *lingua franca* – the language people of different native languages use for mutual communication: “In the world of politics the *lingua franca* of our day is English. The language

of science is English, and the vast majority of papers published in science are written in English.” (Frith 2010: xv)

English is the only language in the world used for communication by people from all ethnic, religious, economic, political and social groups. Its presence in the media has been widely discussed and many people sustain that it could bring certain native languages to extinction. However, the position of English as *lingua franca* is not the subject of this thesis so it will not be further discussed. The brief explanation serves only to illustrate why it is hard to differentiate between English as second or foreign language – its popularity in the world and in the mass media creates a context in which not only is it impossible to avoid it, but it is also impossible not to “pick it up” at least a bit. In order to avoid any possible misinterpretations, in this thesis English will be referred to as foreign language or L2 due to two reasons: (1) in Croatia English is taught from the first grade of the elementary school as the “first foreign language” (Croatian *prvi strani jezik*); (2) although widely present in the media, English is still not the official language of any Croatian community and the communication in English occurs mostly when talking to tourists from abroad. Since this thesis also takes German into account, it will be referred to as the second foreign language or L3.

In discussing any foreign language acquisition, it is essential to understand that not all learners are similar. There are differences related to age, cognitive developments, social status and general knowledge of the world, which exhibit strong impact on the acquisition of a foreign language (FL). On the other hand, all FL learners have acquired at least one language and some researchers believe this is a major advantage. Others, however, disagree and claim that first language (L1) can cause serious problems in FL acquisition due to the interference of L1 and FL (L2, L3). Since this research aims to determine the effects of dyslexia on the acquisition of reading skills in three different languages and is hence interested in the interplay between the L1 and the FLs, only the role of dyslexia as a learning disability and its manifestations in L1, L2 and L3 will be taken into consideration and no other hypothesis regarding the role and the connection between the first language and the foreign languages will be discussed.

As it has been stated above, there are three major perspectives on foreign language acquisition: the behaviourism, the nativist perspective and the cognitivist/developmental perspective. Since all three perspectives have already been discussed in regard to the first language acquisition, only the key difference in the theory of foreign language acquisition will be noted here. Behaviourists advocated the same premises for foreign language acquisition as they had for first language acquisition. Since they were highly influential in the 1940s and the

1950s, their audiolingual method quickly became popular and widely used. The audiolingual approach consisted of “classroom activities [that] emphasized mimicry and memorization and students learned dialogues and sentence patterns by heart” (Lightbown, Spada: 2010, p.34). Their assumption was that foreign language would start from the habits formed in the first language and that these habits would interfere with each other so their theory was often linked to the Contrastive Analysis Hypothesis (CAH):

According to the CAH, where the first language and the target language are similar, learners should acquire TARGET LANGUAGE structures with ease; where there are differences, learners should have difficulty. (Lightbown, Spada 2010: 34)

The researchers failed to prove the CAH because it was discovered that most errors that the learners make could not be predicted based on their first language. Furthermore, adult learners often produce child-like sentences that are usually ungrammatical when translated into their own language, but the similarities in processing between foreign language learners have been noted regardless of their different first languages. (Lightbown, Spada: 2010 p.34)

The rejection of behaviourism and the rise of Chomsky’s followers in explaining first language acquisition had its effect also on foreign language learning theories. Chomsky himself never really offered an explanation or a theory for FL acquisition, but the reactions of his followers were strong. Some incorporated their theories into UG framework by claiming that the learners eventually know more about the language than what was available in the input, which, in their point of view, was a clear indication that UG rules were still available to them, although possibly altered by previously acquired languages. Others rejected the UG framework in regard with foreign language acquisition due to the fact that CPH could not be applicable to adult learners (Lightbown, Spada 2010: 36). One of the most important linguists, who created his own theory based on, but not completely in accordance with the UG grammar, was Stephen Krashen. His 1981 ‘monitor model’ offers five hypotheses on how foreign language is acquired and what the key steps for successful acquisition are:

- (1) *Acquisition-learning hypothesis* – Krashen distinguished between acquisition and learning: acquisition happens unconsciously through exposure to language (i.e. “picking it up”), while the learning happens when we pay conscious attention to forms and rules.
- (2) *Natural order hypothesis* – researchers discovered that the developmental sequences in which the first language is acquired exist also in the acquisition of

a foreign language. Krashen concluded that the rules that are the easiest to formulate were not necessarily acquired first.

- (3) *Input hypothesis* – Krashen believed that in order to acquire language, a learner must be exposed to enough input. Input is defined as the whole of information that is available to the learner in a foreign language. In fact, Krashen stated that learners need to be exposed to ‘comprehensible input’ $(i+1) - i$ being the level of language the learners already know and +1 ‘the step beyond’.
- (4) *Monitor hypothesis* – according to Krashen, when the learner has learnt the rules and has enough time to process their utterances, their learnt system acts as a monitor to their acquired system. Acquired system is responsible for spontaneous utterances, which the learnt system then monitors and corrects according to the learnt rules.
- (5) *Affective filter hypothesis* – not all people acquire language despite being exposed to substantial input and Krashen explained this by taking into account learners’ emotions, attitudes and motives: affective filter is an invisible barrier created by various emotions and other psychological states (e.g. anxiety, stress, happiness) which impedes language acquisition even when there is enough input.²

Krashen’s ‘monitor model’ had a lot of influence on the teaching methods of the period, but many linguists criticized his model because of the impossibility to scientifically measure any of the hypothesis. Again, the response was the cognitivist/developmental perspective. The most important theories within this perspective are Information processing, Connectionism and the competition model. Each of these theories has some differences in regard to others, but all are based on the belief that foreign language is not acquired neither through pure imitation nor through complete immersion in a foreign language community. Lightbown and Spada recognize two different perspectives within cognitivist/developmental theories:

“Some of these theories use the computer as a metaphor for the mind, comparing language acquisition to the capacities of computers for storing, integrating, and retrieving information. Some draw on neurobiology, seeking to relate observed behaviour as directly as possible to brain activity.” (Lightbown, Spada 2010: 38)

² Krashen, Stephen D. (1981). *Second Language Acquisition and Second Language Learning*. Pergamon Press Inc.

Connectionists, for instance, believe that every time a learner hears a word in a certain context, a connection is created in their brain. The more times the learner hears the word in different contexts, the more connections are created, hence the retrieval of the word is easier. (Elman *et al.* 1996)) The competition model theory is closely associated with the connectionism perspective. Advocates of this model claim that through multiple exposure learners come to understand language ‘cues’, which then help them determine the meaning. Each language has its own cues – in English, for example, word order is Subject-Verb-Object and this strict word order serves as a cue for identifying the relationship between the sentence components. (MacWhinney 1997: 116) Information processing theory, on the other hand, claims that language acquisition occurs only when learners ‘pay attention’. ‘Paying attention’ here means that learners use their cognitive abilities to process information. Since there is a limit to how much processing can occur at the same time, learners at different stages pay attention to different information. For instance, learners who are at the beginning of their learning, pay attention to the most important words and try to determine their meaning. Learners at higher levels will have automatized the meaning of these words and will pay attention to function words. (Leow, Bowles 2005: 180)

2.2.THE DIFFERENCES BETWEEN CROATIAN, ENGLISH AND GERMAN ORTHOGRAPHY

Acquiring or learning a foreign language always implies mastering all four skills – reading, listening, writing and speaking. Many learners believe that in order to communicate successfully in a foreign language, they need to be able to speak fluently, but they disregard the importance of other skills. Listening, reading and writing activities are perceived as less important by learners and even some teachers focus solely on speaking and give minor or no attention to reading, listening and writing. However, as it has been stated above, English is the *lingua franca* of our days, present in both written and oral forms, so teaching and acquiring all the skills has become a necessity.

Every language has its own orthography³ and there are multitudes of different systems – over 400 orthographies in the world (Frith 2010: xv). The most common type are alphabetic systems in which each symbol roughly represents one phoneme. Other types include syllabic systems where each symbol represents one syllable, and logographic systems where each

³ “An orthography is [...] the accepted usage of a set of symbols to represent a given language in a written form.” (McDougall, Brunswick, de Mornay Davies 2010)

symbol can represent a morpheme or the whole word. Alphabetic systems are considered to be the most effective in translating the sound-symbol relationship and are adopted by many languages around the world. However, some alphabetic systems have only 26 letters, which often turns inefficient in translating each sound and possible phoneme combinations:

“The 26 letters often prove to be too small a set for the variable number of speech sounds that can be said to use in different languages. Thus, there are arrangements such as digraphs, accents or umlauts to produce more detailed mappings between sounds and letters.” (Frith 2010: xv)

This is not the case in Croatian which is often considered the “ultimate example of a regular language” (Brunswick 2010: 132) with 33 sounds and 33 corresponding letters. English, on the other hand, has 40 sounds with roughly 1120 possible letter combinations (Nyikos 1988). This enormous difference between the sound-letter strings in the two languages creates numerous problems for learners of English, whether it be their first or foreign language. The third language that this thesis considers is German which fits perfectly in the middle between Croatian and English in terms of orthography. Although German is not as easy as Croatian, there are numerous rules which enable learners to decipher the spelling – e.g. German phoneme /ʃ/ is spelled as a string of letters ‘sch’, whereas the Croatian uses only the letter ‘š’. English /ʃ/ can be written just as an ‘s’, as in *sugar*, ‘sh’ as in *shop*, ‘ss’ as in *depression* or *assure*, ‘ti’ as in *action*, *patience* or *initial*, ‘ci’ as in *efficient*, ‘x’ as in *anxious*, and many more. This shows that the English language has a highly irregular spelling, which puts it into the category of opaque or deep orthographies. With its perfect grapheme-phoneme correspondence, Croatian is placed at the opposite end of the continuum and regarded as transparent or shallow orthography, while German falls somewhere in between and is most often regarded as having a semi-transparent orthography.

In discussing the depth of an orthography, or rather the transparency of a language, it is also necessary to examine the syllable structure of the language in question. For example, Romance languages, such as Italian or Spanish, have simple syllables, which consist mostly of a consonant and a vowel (CV syllable) and rarely have any clusters. Romance languages are not the topic of this thesis, but they are used as an example of simple syllable structure because neither German nor Croatian have an exceptionally low level of clusters. German and Croatian are languages with rather complex syllables, but their phoneme-grapheme correspondence is far greater than in English, hence these complex syllables are easier to write or pronounce. Croatian may have the most complex syllable structure of all three since it is possible to have

not only a syllable, but also a whole word without a vowel. However, it is important to state that although it is not a ‘real’ vowel, grapheme/phoneme ‘r’ functions as one in those types of words (e.g. ‘krv’, ‘Krk’, ‘smrt’...). English, on the other hand, has a high number of possible combinations in monosyllabic words: CV (go), CVC (cat), CCVC (prom), CVCC (hold), CCVCC (stamp), CCCVC (spread), CCCVCC (sprained) (Goswami: 2010, p.27). The following figure – adapted from Seymour, Aro and Erskine (2003) (McDougall, Brunswick, de Mornay Davies 2010) – illustrates the complexity and the orthographic depth of some European languages. Finnish is taken as the example of an orthographically shallow or transparent language with simple syllable structure, while English is at the opposite end with both deep orthographic structure and complex syllables.

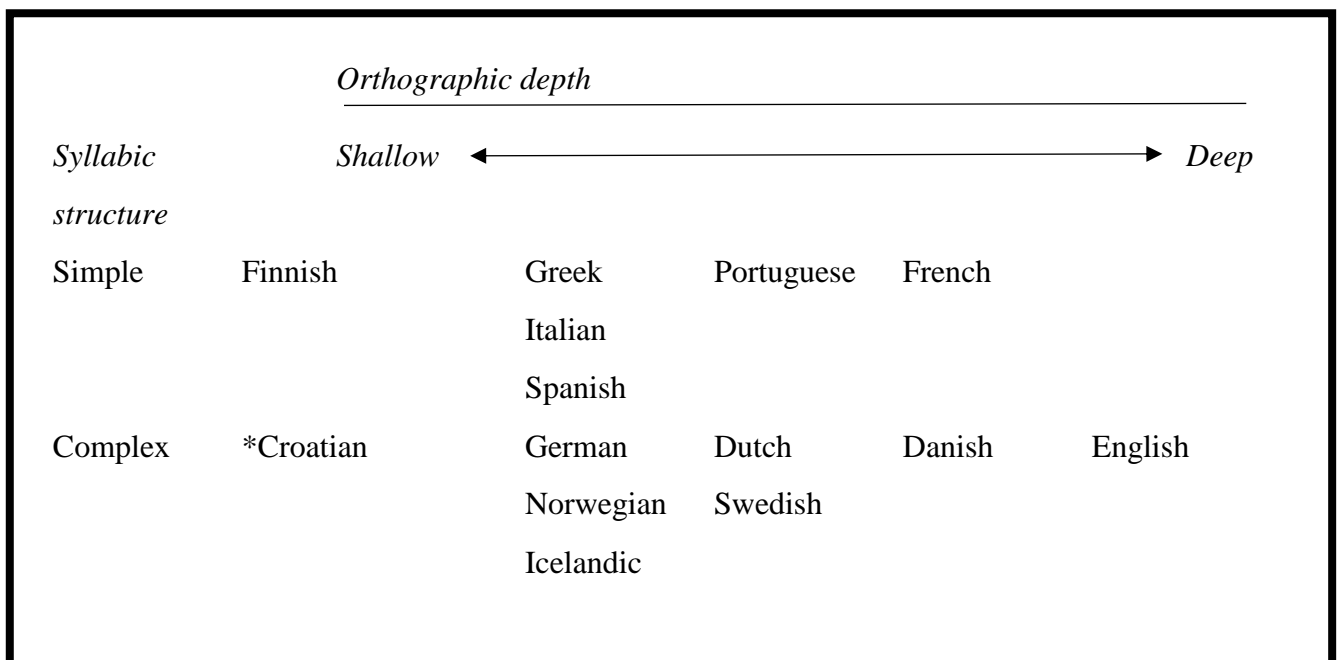


Figure 2. Classification of languages in accordance with orthographic depth and complexity of syllabic structure⁴

Since this classification includes only English and German, I have decided to add Croatian so that the readers could have a clear illustration of the position of each of the three languages that are discussed in this thesis. Croatian is put together with Finnish in terms of orthographic depth for the reasons that have already been explained.

⁴ McDougall, Brunswick, de Mornay Davies 2010: 10

Researchers have often hypothesized on the reasons for a certain language being orthographically deep or shallow. Most of the discussions arise from the factors involved in creating new orthographies. Cahill and Karan concluded that:

Not just any orthography will do; it needs to be effective. That is, it needs to be (a) linguistically sound, (b) acceptable to all stakeholders, (c) teachable, and (d) easy to reproduce. These roughly can be thought of as scientific, political, educational, and technical aspects (Cahill, Karan 2008: 3).

But these characteristics cannot be applied to all existing orthographies. For example, English orthography surely does not match all the criteria. Moreover, English is often described as “a pseudo-historical and anti-educational abomination” (Jespersen 1982) or rather “the world’s most awesome mess” (Pei 1967). The reasons for this complexity of spelling are numerous. Firstly, between 14th and 17th century, there was a change in pronunciation of the English vowels known as the Great Vowel Shift, which resulted in a highly different pronunciation of long vowels in Modern English, as opposed to the pronunciation in Middle English. Furthermore, first English dictionaries were published as soon as the printing press was invented and their main purpose was to establish the ‘correct’ spelling. However, the pronunciation changed through time (e.g. the Great Vowel Shift; words that today begin with silent *h*, such as *honest* or *heir*, were not pronounced like that until the late eighteenth century), but these changes did not reflect on spelling (McDougall, Brunswick, de Mornay Davies: 2010). Secondly, many words from other languages were assimilated into English with all their ‘native’ spelling rules – Latin has given English words such as *aegis*, Greek has provided the terms such as *psychology*, from French there is *blancmange* and from German *abseil* (Brunswick 2010: 132). Hence, today there are many words whose spelling does not reflect ‘typical’ symbol-sound correspondence, but this correspondence was present at a certain period in time and does reflect the tendencies of that period. On the other hand, Croatian and German do not seem hard to spell and mostly follow the symbol-sound relationship, but they have also undergone certain changes throughout history. For example, Croatian diacritic graphemes *č*, *ć*, *š*, *ž* were not in use until the late 18th century and the language reform led by Ljudevit Gaj. Graphemes *č* and *ć* represent a particular difficulty for the speakers of Croatian and there are many debates on why there even exist two different graphemes for two very similar phonemes. Even though Croatian is an example of an almost perfect phoneme-graphic correspondence, these slight differences between the phonemes and the respective graphemes create more difficulty than they ease the spelling.

The rate at which children learn to read and, consequently, the amount of difficulties dyslexic children or adults experience, correspond to the orthographic complexity of the language they speak (McDougall, Brunswick, de Mornay Davies 2010: 11). This claim is further sustained by the orthographic depth hypothesis, which examines two different processes that occur in reading. According to this hypothesis, speakers of transparent languages rely on a sub-lexical (phonological) route when reading and can easily read pseudo-words by relying simply on the knowledge of the symbol-sound relationship. Speakers of opaque languages cannot rely on that type of knowledge and they mostly apply a lexical (whole word) route. When a new word is encountered, sub-lexical and lexical route, as well as the knowledge of rhymes and onsets need to be applied in order to pronounce correctly the new word. Another version of the orthographic depth hypothesis suggests that speakers of all languages use both the sub-lexical and the lexical route in reading, with those from transparent languages applying more phonological processing and those from opaque languages relying more on the lexical processing.

Thus, one can conclude that English-speaking children learn to read at a slower rate than, for example, Croatian-speaking children and that there are more cases of dyslexia in English than in Croatian. Firth (2010) sums up:

“English speakers take longer to become literate than do speakers of other languages. Furthermore, the level of skill reached by English readers and writers is more variable than that of other readers and writers. Dyslexic readers are doubly hit. First, because their brains work in such a way that it is apparently harder for them to segment the sounds and letters. This applies to any writing system that uses the alphabet, however simple and transparent. However, in English they have to make sense of an orthography that is not only very complex but has quirky sets of rules and exceptions.” (Firth 2010: xvi)

However, as it will be shown in this thesis, children all over the world and across different languages struggle with reading no matter the transparency of the language. The strategies they apply may differ, but certainly have some similarities. These strategies are then transferred to foreign languages that they are studying, even though sometimes they prove ineffective thanks to the difference in orthographies.

3. DEFINING DYSLEXIA

It is estimated that 1 in 10 people are dyslexic.⁵ Rough calculations differ across countries with some countries reporting only 0.1% of people identified as dyslexic and others reporting the percentage to be as high as 20% or 30% (Nijakowska 2010: 9). However, not everybody knows about it, and many children struggle throughout their education without their teachers and parents ever realising that their problems with literacy arise from dyslexia and not from their lack of effort. Nevertheless, in order to be able to determine that a child is dyslexic, we need to understand what dyslexia really is and what it is not. Reid Lyon (1995) calls for a precise and inclusionary definition of dyslexia for several reasons:

“First, accurate identification of dyslexia requires that the key symptoms and characteristics be specified. Second, treatment of dyslexia, including early intervention and general teaching methods, must be based on an informed understanding of what difficulties impede reading disabilities. Third, an operational definition is essential for research purposes.”
(Reid Lyon 1995: 3)

There have been numerous attempts to define dyslexia, but the early definitions mostly focused on what dyslexia is not. For example, the 1968 Education for All Handicapped Children Act categorized dyslexia as a specific learning disability which “may manifest itself in an imperfect ability to listen, speak, read, write, spell, or do mathematical calculations”, but excluded children “who have learning disabilities which are primarily the result of visual, hearing, or motor handicaps, of mental retardation, of emotional disturbance, or of environmental, cultural, or economic disadvantage” (U.S. Office of Education [USOE] 1977: 65083). So, according to this definition, children who came from poor families or unusual cultural environments could not be identified as dyslexic. This exclusionary definition forced researchers to propose a number of guidelines for establishing a valid, research-driven, precise inclusionary definition of dyslexia:

1. “The definition must be theory driven. That is, the components of the definition should be based on a theoretical framework [...] that is informative vis-à-vis the skills critical for becoming a skilled reader and that identifies candidate sources of difficulty for poor readers.”
2. “This theory or combination of theories and the resulting definition should be supported by a substantial body of convergent research *and* clinical information.”

⁵ <http://www.dyslexia-international.org>

3. “The evidence for this theory should be based on studies of well-described samples of subjects.”
4. “The definition must be based on constructs that are relevant to the theory, are internally valid, and that can be measured objectively.”
5. “The definition must be externally valid and useful. For instance, the definition should prove clear indications of how to identify whether a person is dyslexic [...], what to assess as predictors of later achievement in young children [...], and what to address in instruction or remediation.”⁶

Based on these guidelines, The Orton Dyslexia Society Research Committee and the National Centre for Learning Disabilities proposed a working definition of dyslexia – a definition that will need to be updated and altered in light of new research findings and clinical knowledge. Their proposed working definition states that:

“Dyslexia is one of several distinct learning disabilities. It is a specific language-based disorder of constitutional origin characterized by difficulties in single word decoding, usually reflecting insufficient phonological processing. These difficulties in single word decoding are often unexpected in relation to age and other cognitive and academic abilities; they are not the result of generalized developmental disability or sensory impairment. Dyslexia is manifested by variable difficulty with different forms of language, often including, in addition to problems with reading, a conspicuous problem with acquiring proficiency in writing and spelling.” (The Orton Dyslexia Research Committee April 1994)

Bogdanowicz (1999) claims that this definition is “clinical in nature” because it focuses on pointing out the characteristic symptoms of dyslexia. It also clarifies the genetic influence on the development of dyslexia and stresses the difficulties in phonological processing. Nijakowska (2010) stresses the importance of terminology in defining dyslexia precisely and states that there are two types of dyslexia: acquired dyslexia and developmental dyslexia. A brain injury or a severe disease causes acquired dyslexia, whereas developmental dyslexia is a specific disorder of written communication, hence not influencing all cognitive areas. Developmental dyslexia is a life-long condition whose features alter with age and can seem to disappear at some point if time due to explicit instruction and correct treatment. However, developmental dyslexia never disappears completely, which will be further shown in this thesis. Students who experience specific learning disabilities (SLD) in their native language encounter the same SLD in foreign language learning. Nijakowska (2010) states that “foreign language

⁶ Reid Lyon 1995: 7-8.

acquisition can be blocked by any physiological or biological deterrents that handicap the learning of one's native language" (2010: 67). Chodkiewicz (1986) highlights that the individuals who struggle with reading in their native language are inclined to face similar failures in attempting to become fluent in a foreign language. In 1989, Sparks and Ganshow proposed the *linguistic coding deficit hypothesis* (LCDH) as an explanation for problems that poor foreign language learners encounter. LCDH highlights the idea that foreign language learning is built on skills in native language and that phonological, orthographic, syntactic and semantic competences in native language serve as the foundation for foreign language learning and foreign language aptitude⁷ (Nijakowska 2010: 68-69).

Since dyslexia is such an intriguing and controversial phenomenon, not only are there several definitions, but there are also many hypotheses on the origin of dyslexia. The most prominent hypotheses are the *Genetic Theory*, *Phonological Coding Deficit Hypothesis*, *Double-deficit Hypothesis*, *Magnocellular Deficit Hypothesis* and *Cerebellar Deficit Hypothesis* (Nijakowska 2010). According to the *phonological coding deficit hypothesis*, dyslexia is caused by a weak phonological coding ability. *Double-deficit hypothesis* suggests that dyslexia includes both phonological core deficit and naming speed impairment. *Magnocellular deficit hypothesis* suggests that individuals with dyslexia may have a specific visual impairment caused by magnocellular deficit which results in unsteady binocular control which brings the impression of letters moving around. *Cerebellar deficit hypothesis* states that the causes of dyslexia can be traced back to the biological level, or rather to a cerebellar malfunction. However, this thesis has no way of confirming any of these hypothesis since no brain scans or neurological research has been conducted through the duration of the study. The only hypothesis that this case study remotely confirms is the *genetic theory* which "presupposes the connection between the occurrence of the disorder and inherited anatomical and functional features of the central nervous system, determining the existence of difficulties in reading and spelling" (Nijakowska 2010: 35). However, once again the present study cannot confirm this theory with empirical evidence since no such research was conducted, but the child in question comes from a family in which both parents are diagnosed with dyslexia, which is in accordance with the *genetic theory*.

⁷ "Aptitude is therefore a theoretical construct (see Jordan, 2004), operationalized in the form of a test, which aims to predict phenomena that characterize second language acquisition (SLA) (such as incidental learning, metalinguistic awareness, fossilization, and others), and the extent to which successful SLA occurs as a result." (Robinson 2013: 1)

To conclude, dyslexia is a hereditary, specific learning disability characterized by problems in single word decoding, usually caused by a deficit in phonological processing. It does not depend on the IQ or the social, cultural and economic background. It is a life-long condition which needs special treatment and explicit instruction. It is also transferred from the native language into foreign language and is in no case a specific foreign language learning disability.

4. CASE STUDY

Most of the data presented in this case study were collected in the period of two months after the precise scope of this thesis was determined⁸. However, some notes from the previous sessions will also be included to give a full insight into the child's intellectual and emotional development.

The choice to do a case study stemmed from the understanding and growth of case study research in the last years. As Harrison and her colleagues (2017) note,

“Case study research is consistently described as a versatile form of qualitative inquiry most suitable for a comprehensive, holistic, and in-depth investigation of a complex issue (phenomena, event, situation, organization, program individual or group) in context, where the boundary between the context and issue is unclear and contains many variables.”
(Harrison, Birks, Franklin, Mills: 2017)

Dyslexia as a specific reading impairment is a complex issue and the purpose of this research was to study this impairment in a specific situation. Furthermore, this research is focused on different techniques that can help the child in question overcome present difficulties. Although dyslexia is characterized by some common features, there is no unique approach to treating a person with dyslexia. Hence, it is necessary to study various techniques in various contexts, especially when the child in question is studying three languages with different manifestations of dyslexia in each of them. Furthermore, there is a lack of research examining the psychological effects of dyslexia and the role of the teacher and this case study aims at not only finding effective techniques, but also at discussing the relationship between the teacher and the students and its beneficial effect on the student's motivation and, subsequently, results.

⁸ I would like to thank my mentors, Dr Marina Grubišić and Associate Professor Irena Zovko Dinković for their help in creating and interpreting this research.

4.1. INTRODUCING THE PARTICIPANT

Ivana⁹ is a thirteen-year-old girl who loves school. I met her three years ago when her parents decided that she needed help in English. When I first arrived, they warned me that Ivana had certain problems with reading, but did not state that Ivana was dyslexic. However, I noticed that Ivana's reading problem was not a result of her lack of trying and I thought she might be dyslexic. At the same time, I was also working with her brother and both parents. Her brother seemed to have no difficulties with reading, but the parents showed signs of dyslexia. After two sessions, I decided to approach the parents on the subject of dyslexia and they confirmed my suspicions. However, they claimed that Ivana had undergone special treatment and that their therapist assured them that Ivana was cured. I did not have any specific knowledge regarding dyslexia, but I knew that it was a life-long condition. Given my curiosity about the nature of this learning disability and my desire to help Ivana as much as I can, I started reading various research and case studies.

One of the key points in my work with Ivana was discovering the fact that dyslexia transfers into other languages. Ivana had excellent grades in Croatian and she could read quite well, although a careful analysis would still reveal certain difficulties. Her parents believed that the strategies she was taught to use were effective not only in Croatian, but also in English. However, they did not understand that the new language had its own rules and hence requested some new strategies. After half a year, the parents let me know that Ivana's performance on reading tasks in Croatian had deteriorated. I immediately assumed the reason were her struggles in English, but I had no method for confirming my theory. I encouraged the parents to work again with Ivana and to help her remember and apply the strategies she had learnt to improve her Croatian reading skills. On the other hand, I started testing various strategies to help her overcome her difficulties in English, including the strategies aimed at increasing her motivation and reducing her anxiety level. As Rachel A. Rosenfeld (1978) noted in her research on anxiety and learning, "given that students' anxiety interferes with their learning and is perceived as a teaching problem, the crucial question is how it might be dealt with." (Rosenfeld 1978: 151) By the end of the school year, Ivana's Croatian returned to its previous level and her English skills improved significantly. Over the following two years, her English reading skills had almost reached the level of her peers.

⁹The name of the participant was changed to protect the child's identity.

Several months ago, at the beginning of this school year, I noticed that Ivana's reading skills were again deteriorating. At first, I could not identify the reason. Soon, however, I noticed that most words that she had trouble reading out were similar to German. I also noticed that she tended to use German accent whenever there was a similar word (e.g. *politics* was read like the German *Politik*). Furthermore, her spelling errors also increased and again one could see the influence of German (e.g. *Haus* instead of *house*). I was aware that Ivana was studying German, but I knew she had started with it a year before. Needless to say, I was quite confused with the sudden influence of German. Again, I could only make different assumptions on why it was happening at the moment and not when she had started learning German.

My working assumption was that neither English nor German exerted any influence in their first year since not much reading was done in either languages. Ivana's problems with English started in her third year because it was only then that they started working on their reading skills – the first two years were mostly songs and short sentences. Ivana's German problems started in her second year – again in the first year there were mostly songs and short sentences and no complex reading tasks were done. In both cases, the reading problems caused by the new language transferred back to the “older” languages.

At the moment, most of Ivana's problems regard reading in German, but she does admit that the biggest problem is her lack of desire to learn the rules for German orthography. Furthermore, Ivana does not like German, which only increases her level of stress and affects her reading skills more. On the other hand, Ivana loves both English and Croatian. She even writes short stories in Croatian, while her parents report that she attempts to communicate in English with them – she constructs short sentences when speaking, and long when writing. Both the parents and I have noticed the amusement and the happiness, which result from successfully saying something in English. Moreover, she often attempts to speak solely in English with me and sometimes gets frustrated if she needs an explanation in Croatian. Given that Ivana's anxiety reaches its highest level when faced with German, it can be concluded that her lack of motivation and anxiousness are consequences of her difficulties. This was also noted by Ganschow (1995), who stated that high anxiety and lack of motivation were usually the consequences and not the causes of language learning difficulties. (Ganschow *et al.* 1995: 78)

Since the most prominent features of Ivana's dyslexia are poor reading skills and lack of phonological awareness, this case study focused on activities regarding the assessment and treatment in the two areas. The reading tasks were conducted in all three languages, while the

tasks for phonological and orthographical awareness focused mostly on English due to its opaque orthography and rich phonemic system.

Regarding other learning disabilities which often appear together with dyslexia, I have not encountered any other during our sessions. Her spelling errors are usually the result of her poor phonemic awareness so the spelling is sometimes quite confusing, but no clear signs of dysgraphia are evident (e.g. mixing the neighbouring letters).

4.2. READING

As it has been stated above, reading has always been a severe difficulty for Ivana. However, thanks to an early intervention of her parents and proper treatment, Ivana is not afraid to read and does not hate reading. Moreover, Ivana is a passionate reader and one of those kids who really do read everything their teachers give them. However, Ivana often admits that reading aloud is a bit “scary” for her, mostly because she is afraid of a bad mark. Ivana is an excellent student and her low marks are always in reading. She is not afraid to read in front of me since we have established a great relationship. Since the beginning, our first and most important rule has been “it does not matter if you make a mistake, it is important that you try and do your best”. I created this rule as a means of showing Ivana that I understood that she had difficulties and that I would never criticize her for not trying enough since I knew that this was not the case. Furthermore, we established our own practice routine: each text is read three times. First reading is Ivana’s and this is usually the most problematic part. Every new text is a new challenge for her and she always expresses her feelings about the complexity of the text as soon as she opens the page. Usually she warns me that she does not really know how to read that, but on rare occasions, she opens a page and eagerly exclaims that “this one is really easy” and she can do it well. The texts she sees as problematic are those with longer sentences, long words or simply scattered all over the page. I have noted on several occasions that the texts which are scattered around the page or have many illustrations turn to be the hardest to read, no matter the complexity of language in use. I believe the reason for this is the fact that all the illustrations and the lack of clean organization in the text take Ivana’s attention away from the text. Although extensive research regarding the effect of illustrations on reading abilities in children with dyslexia has not yet been conducted, some researchers managed to prove that illustrations do not provide enough stimuli to enable easier word recognition. Moreover, Rose and Robinson (1984) note in their research note that

“(a) the added visual cues of illustrations have been found to distract children’s attention from the stimuli that are critical to successful reading (i.e. the printed text) (Braun 1969; Samuels, 1967, 1970; Weintraub, 1966; Willows, 1978); and (b) a primary characteristic ascribed to learning disabled students is the inability to focus selectively on a task and filter out extraneous stimuli (i.e., distractibility) (Clements, 1966; Cruickshank, 1967; Krupski, 1981; Lloyd, Hallahan, & Kauffman, 1980; Ross, 1976).” (Rose and Robinson 1984: 166)

Furthermore, she has more difficulties with texts that are written in a smaller font or with small space between the lines. Rello and Baeza-Yates (2013) tested the effect that some of the most popular MS Office fonts have on the dyslexic readers’ ability to read the text correctly and more easily, and proved that “font types have an impact on readability of people with dyslexia.” (Rello, Baeza-Yates 2013: 7)

In order to help her pay attention solely to the text and to avoid mixing of words from different lines that typically happens to the dyslexic, we took a piece of paper and cut out a long line in it. This prevents Ivana from seeing the lines above or below and helps her focus on the line she is reading.

The second part of our reading routine is divided into two stages. First, I read and Ivana listens, without seeing the text. I read small segments of a sentence and Ivana repeats. We focus on every word and repeat until she has pronounced each word correctly. In the next stage, Ivana looks at the text and follows with a finger each sentence that I read and then she repeats. Even though we practice on reading the whole sentences, the focus is still on the accurate pronunciation of each and every part in the sentence. This is Ivana’s favourite part because she can both hear and see the word. In this way, she not only practices reading, but she also notes the phoneme-grapheme correspondences, which later helps her in writing. On several occasions, Ivana has stated that in order to be able to write a word, she has to see and hear it at the same time. When she is reading, she does not pay attention to the spelling and is only concerned with pronouncing every word correctly.

The third and final part of our routine is again Ivana’s – she reads on her own, but this time I correct her if necessary, or rather I stop her and ask her to correct herself. On some occasions, she will notice the mistake and correct herself. After completing the routine, we pass on to a new text. If it is not a new text, but one that we have already done in this way, then we only repeat the final stage.

4.2.1. READING TASKS

Based on this reading routine, I have created a reading task to measure Ivana's achievement. The task consisted of nine different texts – three in Croatian, three in English and three in German. The first two texts were written in normal font (Times New Roman, 12) with spacing 1.5. The third text was written in the *dyslexie*¹⁰ font, spacing 1.5. Ivana's task was to read the first text on her own (stage 1 of our routine), the second after listening to me (stage 2 of our routine) and the third again alone. She used the cut-out paper in all readings. After each text, I asked her questions to check if she understood the text and only in German were there problems with understanding. The readings were done on three separate occasions and each time the task was the same for all three texts. The texts were given in the following order:

1. Session 1 – Croatian – English – German
2. Session 2 – German – Croatian – English
3. Session 3 – English – German – Croatian

The texts were not given in the same order because I wanted to test if there was any influence of one language on the other, namely the influence of German on English or English on German. As it will be shown later, only the influence of English on German was observed, even though I had previously noticed that German too had some effect on English. Since Ivana and I have an honest relationship, we discussed the results and Ivana concluded that German had influence on her reading in English only when she was previously exposed to a high amount of German – namely, when she had two hours of German in school prior to our learning session. Given the distribution of the texts in the reading task, it is obvious that there was not enough exposure to German to prove Ivana's suggestion.

For each text, speed, number and type of errors¹¹ and understanding¹² were measured and the results are as follows:

	English 1	English 2	English 3
Time	84 sec.	72 sec.	79 sec.

¹⁰ The font was downloaded from the site: <https://www.dyslexiefont.com/en/dyslexie-font/> and was used solely for the purpose of this research.

¹¹ Ellis (1994) retains that errors occur when “there is a lack of competence”, while mistakes occur when learners “fail to perform their competences” (1994: 51). To avoid possible misinterpretations, only the term ‘error’ will be used in this paper.

¹² Understanding was tested with a series of five questions administered orally immediately after each task was read. The level of understanding on the scale 1(low) to 5(high) is the researcher's subjective estimation.

total errors	14	10	15
understanding (1-5)	4	5	4

Figure 2. Overall results on the English reading tasks (see Appendix 1)

	Croatian 1	Croatian 2	Croatian 3
time	58 sec.	58 sec.	86 sec.
total errors	5	3	9
understanding (1-5)	5	5	4

Figure 3. Overall results on the Croatian reading tasks (see Appendix 2)

	German 1	German 2	German 3
time	145 sec.	143 sec.	195 sec.
total errors	21	28	30
understanding (1-5)	3	2	2

Figure 4. Overall results on the German reading tasks (see Appendix 3)

As it can be seen from Figures 2-4, Ivana's proficiency in reading is the highest in Croatian and the lowest in German. This does not surprise since Ivana is not only a native speaker of Croatian, but she has also received proper treatment and knows how to apply different strategies for reading in Croatian. Furthermore, Ivana also "hates"¹³ German because she perceives it as difficult. Her perception is solely based on the complexity and length of German words. At this point it is important to state that Ivana is aware of the existence of rules for reading in German, but she sees them as "too complex" and shows no interest in learning them.

Since I have noted that Ivana struggles with reading the texts that are written in smaller fonts, one of my first assumptions was that the *dyslexie* font would enable her to read more easily. As its name says, this font was created precisely for people struggling with dyslexia and at first glance really seems to work. Even Ivana stated that this font was the best since it was big enough (note that the size of the font was the same) and there was enough space between the lines (again, the size of the spacing was the same). She also added that this font was interesting and "fun to look at". However, a closer analysis reveals that Ivana made significantly more errors when reading in this font than in the standard font. Since the number of errors is higher for all three languages, it can be concluded that this font does not function for Ivana. This does not imply that the font *dyslexie* will not help other readers, but it simply does not suit Ivana's needs. In fact, the research on this particular typeface showed that 84,3% of people read

¹³ Information obtained directly from the participant during an informal talk prior to one of the sessions.

faster and 77,8% made less mistakes¹⁴, but the results of this research show that Ivana does not belong to any of these groups and once again prove that every dyslexic needs a personalized approach. As it was already mentioned, Ivana struggles with texts that are scattered around the page or have many illustrations and, given that this font is “fun to look at”, it probably takes away her attention and the lack of focus and concentration results in an increase in errors. The fact that her understanding of the text decreased for both English and Croatian and remained the same (low) for German further supports the claims about the decrease of attention and concentration. Moreover, when directly asked about the similarity of letters, Ivana pointed out that the letters ‘t’ and ‘f’, and ‘t’ and ‘l’ seemed very similar. When asked to compare the similarity of these letters in the standard (Times New Roman) font, Ivana stated that “they also look similar, but not as much as in that other [*dyslexie*] font.”

Based on our reading routines, my second assumption was that Ivana would read faster and with fewer errors when the text was previously read to her. This assumption proved correct for English and Croatian. She made fewer errors in both Croatian and English and she read faster in English and at the same speed in Croatian. In German, on the other hand, she made more errors while simultaneously reading faster. The level of understanding remained the same in Croatian, increased in English and decreased in German. Since her knowledge of German is not on the same level as her English or Croatian, it does not surprise that she made more errors. Furthermore, as already mentioned, Ivana does not know the rules for reading in German and has a high level of anxiety when faced with German. All these factors have to be considered so that no wrong conclusions would be made. Moreover, this test simulated only one of the two phases of our stage 2 reading routine. The point of the simulation was to see how much the listening part plays the role in Ivana’s reading skills and based on the results in English and in Croatian, it is obvious that listening is important in Ivana’s reading. Hence, it is possible to conclude that she has fewer problems with retrieving familiar phonological information and that the problem arises from her lack of phonological processing skills. However, this study did not test empirically these two skills and, as Gathercole and Baddeley (1993) note,

“Proper resolution of the debate over whether phonological working memory and phonological awareness make common or differentiable contributions to reading development, though, can probably only be achieved by a direct empirical evaluation of

¹⁴ <https://www.dyslexiefont.com/en/background-information/research/>

the longitudinal contribution of the two phonological processing skills to literacy acquisition.” (Gathercole and Baddeley 1993: 269)

In order to understand better the nature of Ivana’s difficulties, errors were not only counted, but also classified (see Figures 5-7 below). Most errors could be placed within six categories, with one category necessarily added to classify German errors. This category is titled “English words” and under this category fall all errors in which Ivana mistook one German word and read it as if it had been an English word (*jungle* instead of *Junge*, etc.). As it was already stated above, I recognized the influence of German on English during our previous sessions, but this was not visible during our tasks¹⁵. The category of “Repetition” comprises those errors which consisted in repeating two or three times a word or a phrase. Here it has to be noted that sometimes the word (phrase) was pronounced correctly, but repeatedly, while sometimes it was pronounced wrongly. In cases where there was a wrong pronunciation, the error was counted as one (see Figure 3 above), but placed in two different categories if the repetition did not bring changes in the correctness of the pronunciation. The category of “Segmentation” indicates those words which were read letter-by-letter, regardless of whether the final pronunciation is correct, or not. The category of “Wrong pronunciation” indicated all the errors which resulted in mispronouncing a word. In English and in German, these errors were based on the phoneme-grapheme correspondence (German group of vocals ‘ie’ pronounced as /ai/, etc.), while in Croatian this category comprised errors in pitch-accentuation. The category of “Different words” included those errors in pronunciation that resulted in pronouncing another word that exists in the given language (*then* instead of *when*, etc.). The category titled “Wrong suffix/no suffix” indicates all errors that consist in reading the word with a different suffix than written, but one that exists in the given language (*den* instead of *dem* in German, etc.) or those errors where the suffix was “lost” (*wish* instead of *wishes* in English, etc.). The last category labelled “Pause” does not indicate errors in pronunciation, but pauses in reading which were longer than five seconds. In English and in German, these pauses were made before a long or a complicated word and they were mostly followed by incorrect pronunciation or letter-by-letter reading. In Croatian, on the other hand, the pauses were made after certain words, no matter their length or complexity, and in these pauses Ivana clearly indicated that she had stopped because of the meaning of the word. She used the pauses in Croatian to ask for clarification of the meaning or to laugh about certain words being used in that particular context. This shows that Ivana’s understanding of Croatian is far greater than that of English or of German. However, when

¹⁵ For further explanation, see page 23 of this paper.

understanding was tested, Ivana showed that she was capable of understanding the texts in English as well as she understood those in Croatian. The only difference in understanding was seen in the way she constructed her responses – in English she tried to use the phrases and structures seen in the text, while in Croatian she used her own constructions, longer sentences and synonyms for the words in the texts. This could be explained by the fact that Ivana communicates in Croatian on a day-to-day basis and is used to formulating her own opinion, while most of her communication in English happens in a classroom context and through a series of premeditated questions and answers.

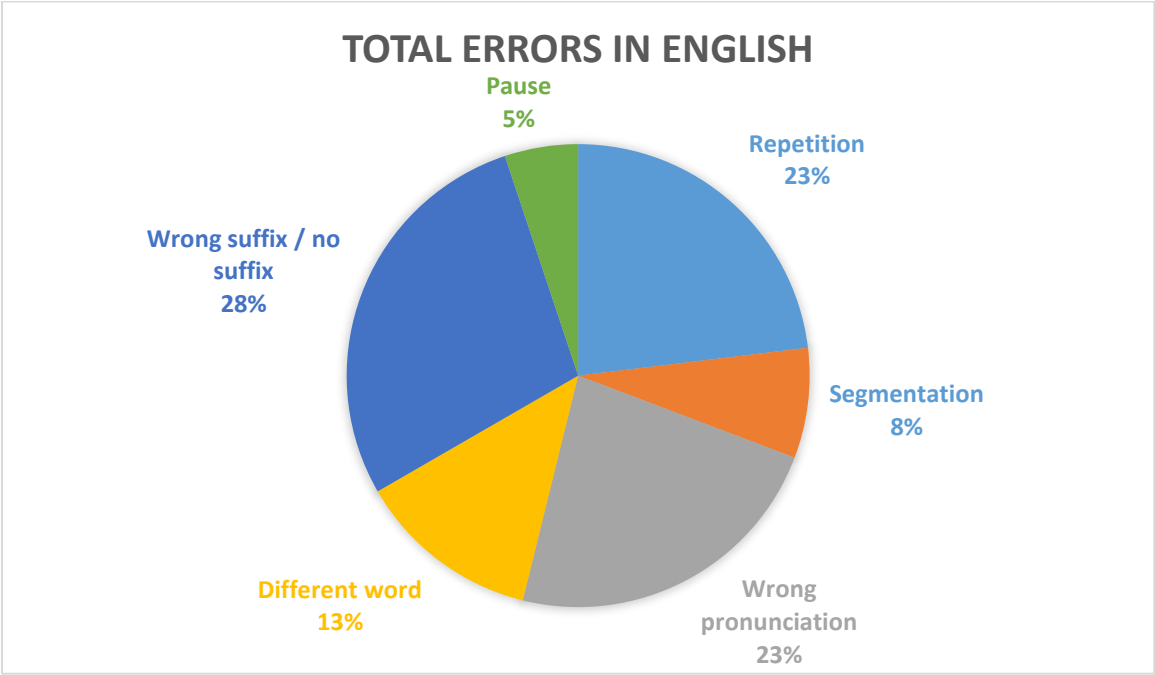


Figure 5. Classification of errors made in reading English texts.



Figure 6. Classification of errors made in reading German texts.

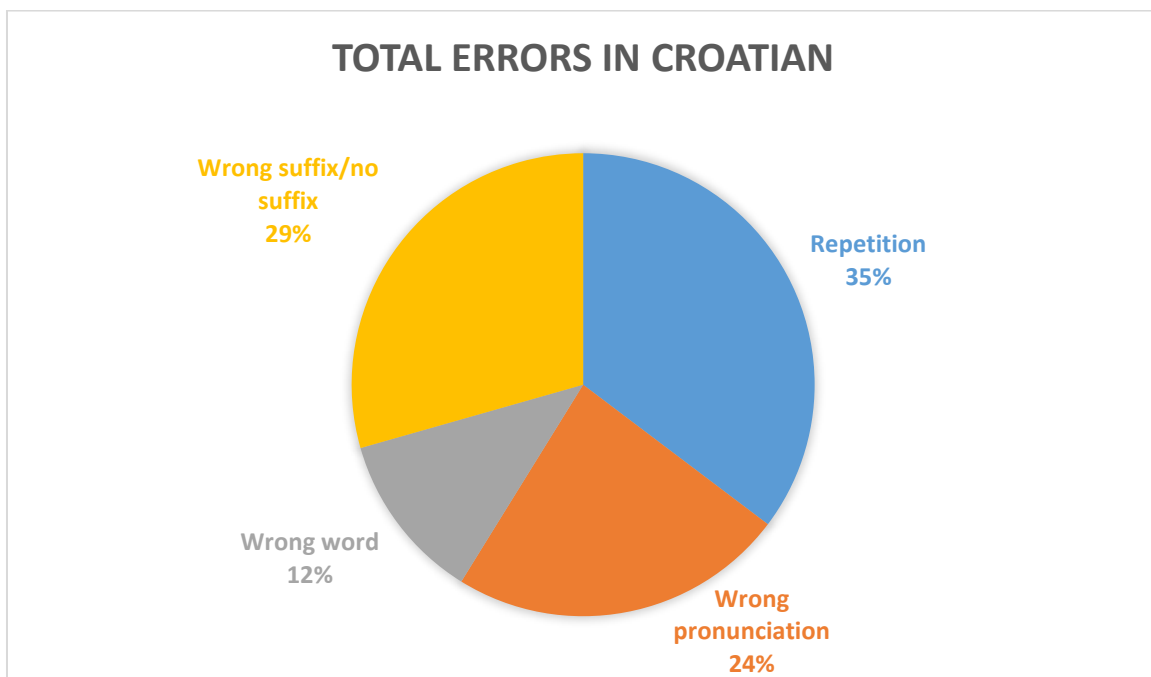


Figure 7. Classification of errors made in reading Croatian texts.

As it can be seen from the graphical illustrations of the errors, most errors fall into categories of repetition, wrong pronunciation and/or wrong suffix/no suffix. The errors in the category of wrong/no suffix sustain the assumption that Ivana relies more on her phonological memory than on her phonological processing skills. Errors in pronunciation are also caused by

her lack of single-word decoding skills, which is by far more obvious in German and in Croatian than in English, due to different orthographic depths of the three languages. The number of errors that consist in repetition of a word or a phrase has been reduced with the use of the cut-out paper guide, but they still reflect a common feature of dyslexics – scanning the text in advance.

4.3. PHONOLOGICAL AND ORTHOGRAPHICAL AWARENESS

Chapter 2.2. of this thesis explains the differences between Croatian, English and German orthography and this knowledge is essential for understanding the second part of this research. This part consisted of a series of tasks directed at testing and raising phonological awareness of the participant, hence raising also her awareness of the phoneme-grapheme correspondence. As Nathalie A. Badian reports, Muter (1994) recognized this relationship and stated that “a minimal level of phonemic awareness and knowledge of at least some sound-to-letter correspondences leads to acquisition of the alphabetic principle, which then propels children through the early stages of literary development.” (Badian 1995: 91) English is the language with the deepest and most opaque orthography of all three languages discussed in this thesis. As it was previously mentioned, Ivana received proper treatment in Croatian and her phonological awareness in Croatian is on the level of her peers. German, on the other hand, also has quite a strict set of rules which Ivana has yet to learn. Furthermore, cross-language research project conducted by Seymour, Aro and Erskine (2003) demonstrated that by the end of their first school year, only 34% of English-speaking children showed 100% accuracy in reading of common and familiar words, while the percentage of German-speaking children was close to 100%. All this was taken into consideration when making the decision to distribute the tasks in this part of the research only in English.

4.3.1. PHONOLOGICAL AWARENESS TASKS

The first task was designed to test Ivana’s phonological awareness. It consisted of a series of smaller tasks¹⁶ distributed orally over the period of two sessions. The results will be shown in Figure 9 below. The first task was titled “Matching” (see Treiman and Zukowski 1991) and here Ivana was asked to judge whether the pairs of words I read had any or no same sounds. In the second task titled “Common unit” (see Duncan *et al.* 1997) I asked Ivana to identify the

¹⁶ The tasks were combined from a series of available research, based on the suggestions made by Lynne G. Duncan (2010). in *Reading and dyslexia in different orthographies*.

syllable or the phoneme that was the same in each word-pair. The third task was titled “Oddity” (see Bradley and Bryant 1983) and Ivana’s task was to detect which of the four words sounded differently. In the next task titled “Blending” (see Lonigan *et al.* 1998), Ivana was asked to combine the sequence of sounds that she heard into a new word. The following task titled “Tapping” (see Liberman *et al.*, 1974) asked Ivana to tap out with a pen the number of sounds she heard in the word. In the sixth task titled “Segmentation” (see Goldstein 1976) I asked her to split up the words I pronounced into syllables and phonemes. The last task was titled “Deletion” (see Anthony *et al.* 2003) and here Ivana was asked to pronounce the word that she heard, but without a particular unit (syllable or phoneme).

<i>Task</i>	<i>Sound unit</i>	<i>Example</i>	<i>Correctness</i> ¹⁷
Matching	Syllable	compete - repeat	+
		delight - unique	+
		difficult - pivotal	-
		biblical - critical	+
	Rime	spit - wit	+
		cry – dry	- +
		rail - snap	-
		mouth – post	- +
	phoneme	smoke - tack	+
		twist - brain	+
		rope - stop	+
		mix - ride	+
Common unit	Rime	boat - goat	+
		fry – cry	+
	phoneme	face - food	-
		mum - milk	-
Oddity	Rime	pin - win - sit – fin	- +
		blow - crowd - grow - draw	+
		pat - hat - cat - sun	+
		blue - cry - fly - sky	-
Blending	Syllable	light - bulb	+
		pill - low	+
	phoneme	s - u - n	- +
		b - a - t	- +

¹⁷ ‘+’ = correct answer, ‘-’ = incorrect answer, ‘- +’ incorrect answer followed by repetition and self-correction

		d - o - o - r	- +
		s - t - o - p	+
Tapping	Syllable	dinner	+
		mother	+
	phoneme	red	+
		stop	+
		fun	+
		shop	+
Segmentation	Syllable	kangaroo	+
		businessman	-
		businesswoman	-
	phoneme	tea	- +
		love	- +
		bread	-
Deletion	Syllable	candy without 'dy'	+
		beautiful without 'ful'	+
	phoneme	cat without 'c'	-
		home without 'h'	-

Figure 9. Phonological awareness tasks results

The results of the phonological awareness tasks show that Ivana has more problems with identifying individual phonemes than with identifying syllables. When a word has the same number of phonemes and graphemes (*red*, *stop*, etc.), Ivana manages to determine the exact number of phonemes. However, since she cannot determine correctly the number of phonemes when the number of phonemes is smaller than the number of graphemes, it can be concluded that in the first case her correct answer stems from her knowledge and recognition of the graphemes and not from her recognition of the phonemes. These results are in accordance with a research on graphophonological processes in dyslexia (Daigle *et al.* 2012) which demonstrated that “dyslexic readers, like their control counterparts, do process phonological information involved in written processes at the graphemic and syllabic level.” (Daigle *et al.* 2012: 93) Furthermore, when asked to combine single phonemes into words, Ivana struggles a lot and manages to do so only after several attempts. For example, when asked to combine phonemes /b/ /a/ /t/ into the word *bat*, Ivana kept repeating the phonemes for 26 seconds before producing the word. Her previous attempts resulted in (pseudo)words such as *pta*, *tab* and *pet*. On the other hand, she was immediately successful when attempting to connect syllables into words. The “deletion” task also confirmed these results since in this task Ivana had no problem in pronouncing a word without one of the syllables, but could not pronounce a word without

one of its phonemes (initial or final). In my opinion, this can be explained by taking into consideration Ivana's phonological memory. As it was seen in the reading tasks, Ivana relies on her phonological memory in reading. It seems that in these tasks she also relied on her phonological memory since she had no trouble identifying the word *beauty* in *beautiful* or *can* in *candy*. However, the word *home* exists in her phonological memory only as a whole and she cannot perceive it as such if one of the phonemes is omitted. These findings are in accordance with one of the basic definitions of dyslexia – “a specific language-based disorder of constitutional origin characterized by difficulties in single word decoding, usually reflecting insufficient phonological processing.” (The Orton Dyslexia Research Committee April 1994).

4.3.2. ORTHOGRAPHICAL AWARENESS TASKS

The last part of the research focused on raising Ivana's orthographical awareness, or rather on showing her certain rules regarding phoneme-grapheme correspondence in the English language. The task was designed based on Nijakowska's *Sample Activities for Learners with Dyslexia Learning English*.¹⁸ The task was divided into two parts and distributed over the period of three sessions. The first part of the task focused on the spelling differences between long and short vowels. The second part of the task included explicit instruction on three different spelling patterns for the /ai/ sound.

During our first session in this series of tasks, I gave Ivana a dictation with 50 words.¹⁹ In order to test whether explicit instruction had any influence on Ivana's awareness of the phoneme-grapheme correspondence, the same words were used in the follow-up dictations in our second and third session. The words were not distributed in the same order, but the words with long vs. short vowel were given in pairs. On the first dictation, prior to any explicit teaching, Ivana miswrote 35 out of 50 words. When asked if she heard the difference between words such as *mad* – *made*, she stated yes, but she spelled the words with the exact same string of graphemes. She asked me to repeat most words and was obviously frustrated after the first dictation. However, after I explained to her that these errors could be easily avoided, she was eager to learn the rules. First, we discussed the pairs of words with long and short vowels and I explained that if two words sound differently, they could (almost) never be spelled in the same way. I wrote the word *mad* into her notebook and asked her to read it aloud. Then I wrote the word *made* and again asked her to read. She pronounced both words correctly. We repeated the

¹⁸ Nijakowska, J. (2010). *Dyslexia in the Foreign Language Classroom*.

¹⁹ For complete list of words, see Appendix 4.

process with word-pair *win-wine* and *hat-hate*. Afterwards, I asked Ivana if she saw any similarities between these pairs and she noted that the words with long vowels (“those that sound longer”) had an ‘e’ at the end. Since she was now aware of the rules, I asked her to write down four more word-pairs of this type and she wrote every pair correctly. During the follow-up dictations, I read the words in pairs, but with a small pause between them and in most cases, she went back to the first word and corrected the spelling after having heard the second (pair) word. However, she still made occasional mistakes or failed to notice the word-pair.

After explaining the difference in spelling between words with short and long vowels, I asked Ivana if she heard anything similar in words *time*, *try* and *tight*. Only after I repeated the words for several times did she notice that all words started with /t/, but she still was not able to identify the /ai/ sound as the common sound in all three words. When explicitly asked if she heard /ai/ in each of those words, she said yes and then recognized that this was another similarity between those three words. I wrote the words in her notebook and explained that the /ai/ sound can be written in three different ways: (1) if the word ends in /ai/, the last letter is ‘y’; (2) if after the /ai/ sound she hears /t/, the word ends in ‘-ight’; and (3) if after the /ai/ sound she hears any other consonant, the word is written as ‘_i_e’. I used simple language and, after each rule, I asked Ivana to write several examples. This part of the task was more complicated for Ivana since she had to focus on what follows the /ai/ sound. In some examples, such as *lime*, she heard the final /m/ immediately and knew which rule to apply. However, when she heard the word *fight*, she struggled to identify /t/ as the final sound. In order to help her, I pronounced the word with explicit accentuation of the final sound /t/. After she identified the sound successfully, she correctly wrote down the word. In the following two sessions, we repeated the dictation with the same words. Before dictating her the words in our second session, we went through the rules together and wrote some examples (different from those which were then used in the dictation). On the dictation, she wrote 34 words correctly. There was one error in recognizing the spelling of the words with long and short vowels and 15 errors in spelling the words with the /ai/ sound. Since once again the problem was the fact Ivana simply could not hear and identify the final consonant, we revisited those 15 words and I accentuated the final consonant. Now that she was able to identify the final sound, she was able to spell all the words correctly. I asked her to study and memorize the rules between our second and third session. During the dictation in our third session, I pronounced each word twice, but without any explicit accentuation of the final sounds. She wrote 41 words correctly. Again, she misspelled one word-pair (*mad – made*) and the rest of the errors were related to the /ai/ sound. Out of eight errors,

five words had /t/ as the final sound. In my opinion, this is caused by the fact that /t/ is a silent consonant as opposed to /m/ which is a nasal, hence easier to perceive.

Based on this orthographic task, it can be concluded that Ivana's difficulties in spelling arise from her inability to identify the phonemes correctly. Her lack of phonological processing ability was confirmed in the phonological awareness tasks and it was once again notable in these orthographical awareness tasks. It is obvious that explicit teaching helped Ivana improve her writing, but in order for her writing skills to reach the level of her peers, it is necessary to raise her phonological processing skills and train her in single word decoding since this is the main cause of her orthographic errors. These findings are in accordance with Berninger's (2013) conclusion that "adding orthographic strategies with "working memory in mind" to phonics helps students with dyslexia spell and read English words." (Berninger *et al.* 2013: 2).

5. CONCLUSION

In this thesis, I have tried to briefly elaborate on some of the most important theories in language acquisition. Although scientists disagree among themselves on how this process occurs, they all agree that language acquisition is a fascinating skill. Furthermore, there is mutual agreement that foreign language acquisition happens similarly to first language acquisition. Some children struggle with becoming literate and acquiring their first language and these struggles then transfer into foreign language acquisition. Researchers have identified several specific learning impairments which impede children from successful language acquisition. The most common type of SLI is dyslexia – a hereditary, life-long learning impairment, usually caused by problems in phonological processing, which is in no way related to the IQ or the social and economic background. However, it is to an extent related to the orthographic depth of the language in question. This does not imply that children whose native language is orthographically shallow or transparent cannot be dyslexic, but they should have less problems in overcoming their difficulties with proper treatment and explicit instruction.

Although dyslexia – as well as any other learning impairment – is not a specific foreign language disorder, this case study managed to prove that some children will encounter difficulties in their native language as a consequence of their foreign language acquisition. Ivana received proper treatment thanks to her parents' early intervention, but the difficulties she faced when starting to acquire reading skills in both English and German transferred to Croatian.

This case study also shows how important the role of the teacher is. Although an excellent student, Ivana is highly anxious when faced with reading tasks in any language and one of the key points in our work together was establishing an honest and trustful relationship. It was also important to make Ivana realize that she had a problem and that I knew that her problem was not caused by her lack of motivation or trying. Furthermore, the task of the teacher is to recognize correctly the root of their pupil's problem. Ivana struggled with reading and writing, but her problems stemmed from her lack of phonological processing ability. Hence, all the tasks I created were aimed at raising her phonological awareness. Moreover, we also worked on increasing her phonological memory. Relying on one's phonological memory can be a great strategy in overcoming some of the difficulties.

To conclude, it is necessary that teachers and parents monitor their children/pupils and recognize their difficulties on time. Early recognition of dyslexia – or any other specific

learning impairment – enables you to determine the root of the problem and create a series of strategies and treatments which will help your children and pupils overcome their difficulties.

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Appendix 1

All three texts have been made using DOLCH word list.

TEXT 1 – standard font, no listening

This is my sister Robin. Her birthday is in March. She is eight years old and she is awesome. Right now, she is playing in the snow with her new toys. She has a lot of wishes and we often laugh at some of them. She likes to play on her own in our round garden. We have five pets: two fish, a rabbit, a kitty and a dog. She loves them very much and she always plays with them in the morning before school. Her favourite colour is yellow because it reminds her of the Sun and summer breaks.

TEXT 2 – standard font, listening before reading

My grandparents live in the mountains. They have a big house. They keep many different animals in their garden: two sheep, four rabbits, a horse and many parrots. Sometimes even some squirrels come. My grandma is the happiest when it is raining because then she doesn't have to clean. My grandpa prefers the sun because he likes to go fishing with his school friend Robin. They go in the morning, bring apples and sandwiches with themselves and stay by the water until evening. My grandpa has a yellow fishing stick, which brings him good luck. They always catch many fish.

TEXT 3 – Dyslexie font, no listening

There are three black bears in the woods. They like to sit in their garden and play with friends. Father's best friends are Robin and Budgie because they like singing. Mum's best friend is Sheep because she is beautiful and white, just like the snow that Mum loves. Baby has many friends: Rabbit, Monkey, Chicken and Squirrel. They always play close to water and come home only when the night falls. However, Baby is sad because he wishes he had a sister. He always says he would bring her flowers because she would be the prettiest bear in the world.

Appendix 2

All three texts have been adapted from the Croatian Educational Portal *Zbornica* (<http://www.zbornica.com/>)

TEXT 1 – standard font, no listening

– Ljubav je lijepa, ljubav je obla, ljubav je kruškasta – govorila je Sanja. – I jabukasta – dodao je Ivan.

– Što je ljubav? – lebdjelo je pitanje u zraku.

– Ljubav je osjećaj koji gajim prema vama, djeco – rekla je učiteljica Maja.

– Ljubav je ono divno što mama osjeća prema nama – rekao je Radosni.

– I ono lijepo što osjećam prema mojem psu Tigru – dodala je Ljupka.

– Ljubav je igra sunca, maestrala i mora ljeti – dodala je Sunčica.

– I priča moje bake prije spavanja – rekla je Latica.

– Ljubav je život! – uskliknula je Lahorka.

– Bez ljubavi nema života, zar ne? – dodala je.

I bila je u pravu!

TEXT 2 – standard font, listening before reading

Jedne je noći u gradsku knjižnicu ušao mali mišić. Bio je silno radoznao. Zanimalo ga je što skrivaju ove čudne stvari sa šarenim koricama. Šetao je tako mišić policama i napokon se zaustavio kod šarenih slikovnica, tvrdo uvezanih, s bezbroj čudesnih, zanimljivih slika.

Razgledao je jednu: prikazivala je djevojčicu s crvenom kapom kako razgovara sa strašnim vukom. Bila je to priča o Crvenkapici. Razgledavao je tako mišić slikovnice – Pepeljugu, Trnoružicu, Snjeguljicu, Gullivera, i mnoge druge. Odjednom se sav ukočio. Njuškica mu je probljedila, a crne očice nemirno zakolutaše. Miš je naišao na slikovnicu Mačak u čizmama i silno se uplašio.

TEXT 3 – Dyslexie font, no listening

Bile tri sestrice, tri male snježne pahuljice. Dolepršale su jednog dana na zemlju i tu su se vrlo dobro osjećale. Još su se u zraku dogovorile da se nikad neće rastajati. Ali slučaj je ipak htio drugačije. Puhnuo je vjetročić, razdvojio je tri nestašne sestrice. Svaka je otišla na svoju stranu i svaka je doživjela svoju priču. Prva i najkrupnija pala je na rukav kaputa koji je pripadao nekom starčiću. On ju je pogledao i rekao: – Kako si lijepa, moja snježna pahuljice! Nema na svijetu ništa ljepše od tebe! – Bio je taj starčić pjesnik i sačuvao je mlado srce.

Appendix 3

All three texts have been adapted from the Student's Books *Schritte 1.1, Studio D A1, Themen aktuell 1*.

TEXT 1 – standard font, no listening

Hans ist ein kleiner Junge aus Deutschland. Er ist 10 Jahre alt. Er ist Schüler. Hans besucht die Grundschule „Gottfried Benn“ in Berlin. Hans lebt in einem großen Haus mit seiner Familie. Sein Vater ist Automechaniker und seine Mutter ist Lehrerin. Hans hat keine Geschwister. Jeden Sommer fährt Hans mit seiner Familie nach Kroatien. Deswegen spricht Hans sehr gut Kroatisch. Englisch kann er auch gut. Sein Lieblingsfach in der Schule ist aber Mathematik und er ist der beste Mathe-Schüler in seiner Klasse.

Am liebsten isst Hans Fleisch und Kartoffeln. Hans mag auch Kaffee, aber seine Eltern kochen nur Tee.

TEXT 2 – standard font, listening before reading

Hallo, Stefanie!

Ich bin jetzt in Hamburg. Ich besuche meine liebe Tante und ihren Mann. Hamburg ist eine sehr schöne Stadt. Hier war ich noch nie. Gestern war ich im Museum für Kunst und heute gehen wir in den Hamburger Zoo. Im Internet steht, dass sie eine Giraffe haben. Cool, oder? Leider regnet es schon seit 3 Tagen.

Und wie geht es dir? Ich weiß, dass du am Montag nach Dubrovnik fährst. Wirst du in einem Hotel schlafen? Dubrovnik ist auch eine schöne Stadt mit vielen Sehenswürdigkeiten und coolen Stränden. Ich hoffe, wir sehen uns bald!

Viele Grüße aus Hamburg!

TEXT 3 – Dyslexie font, no listening

Was macht ein typischer Deutscher? Er steht um 6 Uhr auf. Danach frühstückt er, meistens ein Stück Brot mit Schinken und Käse. Dann putzt er sich die Zähne und geht zur Arbeit. Man arbeitet normalerweise von 8 bis 16 Uhr. Am Arbeitsplatz muss es immer eine Pause geben. Nach der Arbeit gehen die meisten Deutschen nach Hause, aber manchmal gehen sie ins Café, Kino, Schwimmbad oder Restaurant. Zu Hause erholt man sich nach einem anstrengenden Tag. Nach dem Abendessen sieht man einen Film an oder liest ein Buch. Zwischen 10 und 12 Uhr sind die meisten Deutschen schon im Bett.

Appendix 4

Group 1

mad – made

met – mete

win – wine

hop – hope

cut – cute

hat – hate

mat – mate

Group 2

time

nice

smile

size

pine

like

five

mine

prize

lime

mile

Group 3

try

cry

spy

fly

by

why

sky

rely

reply

shy

July

my

dry

deny

Group 4

light

sight

bright

fight

fright

might

night

right

tight

slight

flight