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THE MOTHER-TONGUE AND ENGLISH LANGUAGE SPEECH DECODING AND READING PROCESSES OF HUNGARIAN PRIMARY SCHOOL PUPILS

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1. Introduction

Since Hungary joined the European Union there has been an increasingly urgent need to learn foreign languages. Because of the growing significance of foreign languages, people need to gain a high-quality, competitive and practical command of a foreign language or sometimes at least three foreign languages (cf. Fehér könyv az oktatásról és képzésről 1996). However, it has to be considered how good the level of the mother-tongue skills of the majority of schoolchildren is, including those learning the language, in their command of one or more foreign languages (at an intermediate level) in order to allow them more chances on the labour market.

Regarding foreign language teaching and learning Szépe (2001) claims that the fundamental problem around the millennium was that the principle of foreign language teaching in the Hungarian Public Education System had not been fulfilled in a unified way or in a form and framework required by real practice. The efficiency of language learning as well as the state of command of the foreign language and skills development can truly be determined by the language education political decisions, but these can also be affected by the quality of the children’s underlying mother-tongue mechanisms, which develop effected by many determining factors. In the functions of the mother-tongue in addition to speech production, the speech decoding mechanism plays an important role. This has two basic components: speech perception (recognition and identification of the smallest meaningless units of the spoken language) and speech comprehension (understanding and interpreting the meaningful linguistic units) (Gósy 1992:10). Even with typically developing children, failure in their level of school achievement can often be attributed to the inaccurate functioning of the mother-tongue speech decoding mechanism. Without adequate diagnosis and therapy, this can have negative consequence on how the child’s abilities, skills and knowledge of matter may function, which can later lead to difficulties in written skills development and in expanding the foreign language mental lexicon; that is the capability to learn new words). These facts have been supported by the poor results of some of the international research (cf. the scientific investigations of PISA and PIRLS) and the Hungarian monitor tests carried out in order to assess the quality of the mother-tongue written skills of different age groups of children in the last decade. To sum up, those problems that can be attributed to the underdeveloped speech decoding mechanism i.e. the poor level of auditory and visual text comprehension abilities, might impede the general learning process since the effective development of language content and skills relies heavily on these underlying processes. Therefore it is essential to develop them not only during the mother-tongue lessons but also within the field of other school subjects.

The dissertation has three main aims. Firstly, it aims to assess the quality of the mother-tongue and the foreign language speech decoding mechanisms of 10 and 12-year-old Hungarian schoolchildren studying English at primary school. Secondly, the dissertation explores the relationship between the subjects’ reading skills and reading comprehension performance in two languages (Hungarian and English) and finally compares these results with the level of pupils’ speech decoding achievement. (The links between the different areas of the research study are presented in Figure 1.) In addition, I also intended to examine whether there are any differences between the functioning of the speech decoding systems, the reading skills and the reading comprehension performances of the subjects who started learning English in the first and in the third form of their primary school studies.
To briefly summarise the significance of the research results, firstly, they provide new data in the investigation of the mother-tongue and foreign language speech decoding and reading processes of the pupils studying in the state lower and upper primary public education system. Secondly, the analysis of the research data helps define the interconnections and problem areas between the speech decoding system and reading comprehension of the Hungarian learners of English of different ages and different length of time (two, four and six years) spent on foreign language learning. Finally, the research findings and the conclusion can be beneficial both to the field of the theoretical sciences and to educational practice, such as in applied linguistics, speech therapy and foreign language pedagogy. The dissertation achieves its purpose by providing sample tasks aimed at developing certain levels of the foreign language (English) speech perception and speech comprehension mechanisms as well as the written skills.

2. The structure of the dissertation

The dissertation includes 11 chapters which deal with different issues:

In the Introduction the choice of research topic is defined and the aims of the study are introduced.

Chapter 2 deals with the topic of the speech decoding mechanism and takes the following issues into consideration: the complex system and the mental organisation of auditory decoding processes as well as the mother tongue language specific basis of speech perception. Furthermore, after giving a brief overview of the most significant models of the speech decoding mechanism, Chapter 2 introduces the three-level, hierarchical, interactive model in detail, and analyses the interrelation between the acoustic, phonetic, phonological, syntactic, semantic and association levels. In addition it analyses the functioning of the related sub-processes of speech perception (serial and visual perception, sound differentiation and word association) because this model provides the framework for the test batteries used in the practical part of the dissertation (cf. GMP-diagnostics, Gósy 1995b/2006; 1997). The second part of the chapter deals with the issues related to the topic of the mother-tongue mental
lexicon and the process of the lexical access. It also gives an overview of the disorders and the different types of errors which can be observed during the auditory processes.

Chapter 3 deals with the issues of young learner foreign language learning from the aspect of psycholinguistics and language pedagogy. First, it highlights some basic theories of first language and foreign language acquisition as well as the dilemma of the acquisition and learning processes. In addition, Chapter 3 discusses the interrelation between the underlying mental processes of the mother-tongue and foreign language. Finally, it investigates the effect of the starting age on learning a foreign language, which is a crucial factor in the practical part of the study.

Chapter 4 explores the connection between the speech decoding and the teaching-learning processes of the written language (mainly reading). In the field of the auditory and written language interdisciplinary research area, first the reading process and its main phases of development are introduced with the help of different models. When comparing the process of auditory and written comprehension the abilities, basic skills and the knowledge of matter which are prerequisite for the process of reading are discussed. Within the topic of teaching reading the system of the reading skills is introduced with the focus of the possible aspects of developing text comprehension. Other highlighted areas of this chapter are some of the methodological considerations of the mother-tongue and foreign language reading instruction, the typology of the errors occurring during the process of reading, and the problems that can be experienced through the performance of reading comprehension.

Chapter 5 introduces the background to the research (hypotheses, methods, materials, subjects etc.) regarding the mother tongue and foreign language speech decoding and reading processes.

Chapter 6 contains a detailed analysis of the qualitative and quantitative research results for both languages. For the evaluation, different types of statistical methods were used which are mainly introduced in the subchapters. First, the pupils’ speech perception and comprehension results in the mother tongue and in the foreign language are discussed. The analysis of the lexical access subtests in both languages is provided separately from the evaluation of the decoding processes as these subtests were carried out in writing instead of oral assessment. The second subchapter contains the research results for the reading skills (cf. error analysis and speed of reading) and the reading comprehension in both languages.

In Chapter 7 the research results are summarised by referring back to the hypotheses listed in Chapter 5. It also lists some statistical correlations that had not been mentioned so far.

Chapter 8 contains the conclusion of the dissertation, the significance of the research, and the questions which have been raised through the analysis of the research.

Chapter 9 introduces the possibility of applying the research results in the teaching-learning process in the form of some task types that are suitable for developing the lower and upper levels of the English speech decoding processes and the written skills.

Chapter 10 contains the list of references.

Chapter 11 includes the appendices: the subtests used for assessing the mother-tongue and the English speech decoding processes; the texts for testing pupils’ reading skills and reading comprehension with the 10 questions and answers; the list of errors used for the error analysis of the speech perception processes; the types of errors used for analysing students’ reading skills; detailed typologies of error by different authors; and the description of the tasks with some examples designed for developing the levels of the speech decoding mechanism and reading skills of Hungarian learners of English.
3. The background of the research

Regarding the subjects of the research 112 fourth-former and 116 sixth-former typically developing learners of English took part in the study from 9 primary schools of Győr and its surroundings. The 10-year old pupils were selected from 8 different schools, the 12-year old ones from nine schools. As for the institution locations, city, suburb and village schools were involved in the study, as well as a school teaching through alternative pedagogical methods. The main aim of choosing the 10- and 12-year-old subjects for the study was that children from the lower and the upper primary sections should be represented whose biological characteristics and cognitive processes are conceivably different. Furthermore, it was also of vital importance that all the subjects should at least be in their second year of learning English formally (at school), therefore the reading and writing skills of the younger and the older groups should be well enough established in their mother tongue. Table 1 shows the data of the participants in more detail.

<table>
<thead>
<tr>
<th>FORM</th>
<th>GROUPS*</th>
<th>the group code</th>
<th>NUMBER of STUDENTS</th>
<th>GENDER</th>
<th>AGE (division)</th>
<th>AGE (mean)</th>
</tr>
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<tbody>
<tr>
<td>4th</td>
<td>2nd year (1st group)</td>
<td>4/2</td>
<td>N=42</td>
<td>M (N=24), F (N=18)</td>
<td>[9;1–11;2], [9;8–11;9]</td>
<td>10 years 2 months</td>
</tr>
<tr>
<td></td>
<td>4th year (2nd group)</td>
<td>4/4</td>
<td>N=70</td>
<td>M (N=35), F (N=35)</td>
<td>[8;1–11;0], [9;9–10;9]</td>
<td>10 years 2 months</td>
</tr>
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<td></td>
<td></td>
<td>N=112</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6th</td>
<td>4th year (3rd group)</td>
<td>6/4</td>
<td>N=35</td>
<td>M (N=20), F (N=15)</td>
<td>[12;0–12;9], [12;0–13;11]</td>
<td>12 years 2 months</td>
</tr>
<tr>
<td></td>
<td>6th year (4th group)</td>
<td>6/6</td>
<td>N=81</td>
<td>M (N=42), F (N=39)</td>
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<td>12 years 2 months</td>
</tr>
<tr>
<td>total:</td>
<td></td>
<td></td>
<td>N=116</td>
<td></td>
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</tr>
</tbody>
</table>

* groups of learners formed on the basis of the years of their English studies

In my research I aimed to compare the performance of not only the 10- and 12-year-old pupils but within each age-group I selected other two groups (altogether 4)\(^1\) in order to be able to compare the performance level of the mother tongue and English speech decoding and reading processes of the children of different age-groups studying English for the same length of time (4 years).

To be able to compare the results of different age-group pupils, the same tests were used. To assess speech perception, its related sub-processes and speech comprehension, I selected 13 subtests (L1_GMP2,3,4,5,7,8,9,10,11,12,15,16,17) from the Hungarian standardised GMP test battery (Gósy 1995b/2006). For the foreign language assessment I used the corresponding British English version of the first language test battery (Gósy 1997; L2_GMP1,2,3,4,5,6,7,8) and extended it with another subtest (visual perception, L2_P11), which made it possible to compare more data collected in both languages.

For the assessment of the mother-tongue reading comprehension and reading skills I used a short-text (cf. Juhász 1999:107). The foreign language reading comprehension and reading

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\(^1\) the four groups are the following: 4th formers studying English for 2 years (4/2) and 4 years (4/4), 6th formers studying English for 4 years (6/4) and 6 years (6/6) at school
skills were tested by a specially designed, reading for pleasure type of text considered to be easy enough to read and understand after one or two years studies of English. It was about everyday situations in general English, using basic grammar structures.

Children were assessed in their own institution during the morning lessons which took about 40-45 minutes in case of each learner. Therefore the complete time devoted to the assessment of all subjects took nearly 5 months. The tests were usually done in a non-soundproof small room provided by the school for this purpose. To be able to ensure the same conditions and exclude all the disturbing background effects (e.g. noise) students were given headphones while testing the speech decoding processes.

The general method of the assessment of each level of the speech perception mechanism in the first and the second language required subjects to repeat recorded authentic speech signals. Regarding sentence perception, students had to choose the correct picture relevant to the sentence uttered by the examiner. Sentence comprehension was tested with ten comprehension questions in Hungarian in both languages after listening to the recorded Hungarian text and the English one. During the sound-differentiation subtest, the subjects had to make a decision about whether they heard the same or different information (the two options were “same/different”). The lexical access of pupils in both languages was tested in writing when subjects were asked to list as many words as possible within 100 sec prompted by given stimulus syllables (ma-, ke-) in Hungarian and stimulus sounds ([m],[k]) in English. The reading skills as well as the reading comprehension performances were always tested after the assessment of the speech decoding systems by ten Hungarian comprehension questions in both languages (without any further visual clue).

Data processing was carried out with the help of some statistical programmes SPSS 13.0 (Pearson correlation analysis, MANOVA multi variance analysis, One-way ANOVA, Tuky Post hoc test). Between 183 and 205 pieces of data were gained for each child depending on the minimum and the maximum words pupils could repeat in the short term memory tests. The data of the lexical access subtests and the reading speed tests in both languages were dealt with separately as I could not convert these results into the same data type as those above. The total amount of data collected was between 41724 and 46740 in number. On the test sheets, the results of the quantitative and the qualitative analysis were documented.
4. Research results

To sum up the research results, the following statements can be made about the mother-tongue and English language speech decoding mechanism and reading processes of 10- and 12-year-olds.

(a) The assessment of the participants’ results revealed a faulty functioning of their speech decoding mechanism in all subtests not only in the foreign language but also in the mother tongue compared to the expected average mean values defined in the GMP test battery guide. The poorer test results were found in all age-groups as well as in the 4 groups created on the basis of the age and the time spent on their English studies. According to the results of learners in both languages regarding speech perception the greatest difficulties were found on the phonological level (fast sentences subtest), and in case of speech comprehension the semantic and association levels (auditory text comprehension) were also found to be largely hindered. On the basis of the mother-tongue test results the related sub-processes of speech perception (semantic and visual perception) of all 4 subject groups seemed to be faulty functioning. However, concerning the foreign language assessment some of the meaningful words masked by white noise as well as the filtered sentences were found to be difficult to perceive by the pupils of all 4 groups (c.f. figure 2 and 3).

**Figure 2** | *The Hungarian GMP subtest results of the 4 groups of participants*

According to the qualitative data analysis of the speech decoding mechanism, the errors observed during the mother tongue assessment showed similar tendencies; however, concerning the foreign language assessment more diverse types of errors were detected (c.f. Simon 2006, 2009). As for the English word perception test results (L2_GMP2,4) the most typical errors were the substitution of and the omission of certain sounds, while the analysis of the sentence perception tasks (L2_GMP1,3,5) showed frequent sound and word exchanges of the subjects. Before the foreign language assessment, I assumed that pupils would have the
The greatest difficulties with the perception (and/or the production) of sounds slightly different or not to be found among the Hungarian sounds. The detailed analysis revealed that the majority of the pupils in fact found these sounds hard to perceive (i.e. the vowel exchanges during the identification of words masked by white noise $[\varepsilon] \rightarrow *[\varepsilon] *[\partial] *[\Lambda] *[\alpha i]; *[\alpha i] \rightarrow *[\partial]$), $*[\alpha i] *[\partial]; *[\partial] \rightarrow *[\alpha i] *[\partial] *[\alpha i] *[\partial]$). However, other types of sound exchanges were found at many tasks which were not considered to be truly English sounds (i.e. [l]–[n]; [d]–[t], [b]–[p] substitutions). Therefore I think that the errors that occurred during the assessment of the functioning of the speech decoding mechanism cannot be contributed to the possible inflexibility of the mother-tongue system of perception.

**Figure 3** | The results of the English speech perception and comprehension subtests of the 4 groups of participants

(b) Regarding the data of all research subjects the faulty functioning of some levels of the speech perception mechanism showed significant correlations with the operation of the speech comprehension processes (cf. auditory sentence and text comprehension tasks) in both languages. To conclude, the perception problems observed in the lower levels of the speech decoding system could determine the functioning of the higher levels. Between the numerous interconnections of the different levels of the speech decoding mechanism in each language, I found two significant differences. On the one hand, the number of interconnections between the lower and higher levels of the decoding mechanism was much less in the mother-tongue test results than with the foreign language assessment. On the other hand, while the quality of the significant correlations was considered to be weak in the Hungarian statistical results, regarding the English results, the statistical analysis revealed much stronger correlations (cf. medium strong and strong significant functions) between all the subtests. It is therefore concluded that the lower levels of the speech decoding system seemed to function less independently in the foreign language than in the mother tongue.

Considering the interrelations between the subtest results of the same and different lower- and higher-level processes of the mother-tongue and the second-language speech decoding system revealed in the form of slight significant correlations, it cannot clearly be proved that the weaker functioning of the acoustic, phonetic or phonological levels (compared to the expected mean values) of the mother-tongue speech perception hindered the speech comprehension performances in English.
On the basis of the data of all subjects, the subtest results of the higher levels of the speech decoding processes in the mother tongue did not show correlation (cf. other similar results in literature, i.e. Gósy 2005). This indicated that the underlying mechanisms of the auditory sentence and text comprehension tasks functioned independently in the research sample. However, the foreign language analysis revealed that apart from the (medium strong and strong) significant correlations found between nearly all the subtest mean values of the speech perception system, the two levels of the speech comprehension processes also showed correlation (cf. in the form of a medium strong linear function). This means that the syntactic, semantic and association levels of the speech decoding mechanism with the English sentence and text comprehension tasks, functioned interdependently.

To compare the results of the mother-tongue and foreign language speech perception and speech comprehension of the different age-groups, I found mean values tended to improve with older learners; that is the 12-year-old pupils scored better but just rarely significantly better than the 10-year-old ones in both languages. By comparing the results of the 4 groups it was not always possible to detect significant linear improvement in the performances of pupils depending on the length of time (two, four or six years) spent on their English studies either in Hungarian or in the foreign language. The results of the two different age-groups studying English for the same number of years at school (4/4 and 6/4) showed that the younger ones scored better in more tasks in both languages. Significant difference could only be traced by the results of the two groups in two tasks (L1_GMP17k; L2_GMP6). Therefore the research hypothesis, assuming that the better speech perception and comprehension results of the younger ones can be related to the possibly positive effect of the early starting age of language-learning (in the 1st form), was not verified. Finally, the length of time spent on the English studies seemed to be a determining factor in the speech decoding, mainly in the quality of the speech perception processes between only two groups (4/2 and 6/6).

Regarding the functioning of the underlying short-term memory processes of the speech decoding mechanism, before the research I assumed that the capacity of the short-term visual memory would be better than that of the verbal memory concerning the research sample. Furthermore, I hypothesised that the older age-groups would be able to recall more words than the younger ones. The first hypothesis was proved by the study results; that is the capacity of the short-term visual memory was found to be better than that of the verbal one not only with the two age-groups but also with the 4 groups formed on the basis of the length of time spent on English studies. The second assumption was also proved by the means of the two age-groups. However, on the basis of the four-group distinction none of the language test results indicated a significant linear improvement that correlated to the tie spent on the English studies.

By the statistical comparison of the performances of the short-term memory and the speech decoding processes of all subjects, the analysis showed that neither the verbal nor the visual short-term memory capacity had a significant impact on the mother-tongue speech comprehension scores. However, slight significant functions in some levels of the speech perception processes could be detected (between L1_GMP8 and L1_GMP2,3,4; L1_GMP9 and L1_GMP4,10,5,7). Regarding the results of the foreign language analysis, no correlation was found between the data of the visual short-term memory and the speech perception or comprehension processes. However, weak correlations were detected between the capacity of the verbal short-term memory and the lower- and higher-level of the English speech decoding
Therefore we can conclude that the capacity of the short term verbal and visual memory did not have a significant impact on the functioning of the mother-tongue and English language speech perception and comprehension mechanism in case of the two age-group samples.

(f) Considering the mother-tongue word association subtest results, which provide information about pupils' speedy and efficient recognition and interpretation of lexical units, the 12-year-olds scored better than the 10-year-old ones, but not significantly better. Furthermore, the analysis showed that the rate of incorrectly activated words was less by the older pupils. However, the results of the foreign language lexical access showed significant difference between the two age-groups tested. Moreover, the pupils from each age-group recalled much less words in English than in the first language, which – apart from other underlying factors – can be first and foremost contributed to the unifying effect of the foreign language input (cf. Simon 2009). The number of the activated lexical items did not show a significant linear improvement due to the factor of the growing number of ages and years spent on English studies neither in the Hungarian nor in the foreign language assessment. The qualitative analysis of the word association subtests revealed that the recalled words were more varied and individual types among the 12-year-old sample than the younger generation. Finally, the majority of the activated mental lexicons were nouns and the most often recalled 10 words showed great similarities in both languages.

(g) Besides the poorer performances in speech decoding processes, the reading comprehension performances of the subjects were also far below the expected levels in both languages. The 12-year-old pupils' text comprehension results were significantly better than that of the 10-year-old ones. The data of the reading comprehension was not improved by the growing number of ages and years spent on the English studies in either language. To conclude, the figures revealed that the different test results in the mother tongue could rather be contributed to the age differences. However, concerning the English performances of the pupils, the length of time spent on the foreign language studies was considered to be significant by one group (4/2). The much weaker results of the pupils studying English for only two years compared to the other three groups’ performances might have been in relation to their poorly-developed reading skills (cf. the largest rate of the reading errors were documented by this group). Therefore it seems that the length of time – two years – spent on the foreign language studies was not enough for the particular group to develop the syntactic, semantic and association levels needed for the successful decoding. Moreover, the other three groups’ similar average results of the reading comprehension, suggested that after at least four-years of study, the length of time spent on learning English did not have a significant impact on the performance of the subjects. The absence of the qualitative development in the reading comprehension performance of these groups might raise quite a few questions, especially in the field of language pedagogy.

(h) Before the research I assumed that if some of the levels of the speech decoding mechanism of the pupils did not function well, then this might have an impact on their reading text comprehension performance in both languages. On the basis of the correlation analysis based on the mother-tongue data of all subjects, it was revealed that the functioning of the phonetic, phonological, syntactic, semantic and association levels as well as the sound-differentiation ability of different speech sounds and the capacity of the short-term verbal
memory, might result in a poorer reading comprehension performance. Regarding the English data it was shown that the functioning of all lower- and higher-levels of the speech decoding mechanism could determine the subjects’ reading comprehension results (cf. weak and medium strong significant correlations).

(i) Qualitative analysis of the reading skills assessment revealed that the pupils made quite a few errors during reading aloud the given texts in both languages but there was a decided difference between the rate of these as the registered number of errors by the English reading aloud process was three times more than that of the mother-tongue test. Furthermore, I found that the 12-year-olds made mistakes more rarely than the 10-year-old sample. The rate of errors occurring during reading and the pupils’ reading comprehension results showed an interrelation. This means that the more mistakes that were made in the reading aloud process, the weaker results pupils achieved in the comprehension task. To conclude, a more effective functioning of the decoding mechanism while reading, might probably promote better text comprehension.

Regarding the analysis of the foreign language reading skills, I found that the groups who had been learning English for longer (4/4 and 6/6) of each age-group tested made fewer mistakes while reading aloud the text than the pupils of the other two groups who had spent less time learning English at school (4/2 and 6/4). Furthermore, the better quality text decoding abilities of the groups 4/4 and 6/6 were also accompanied by better speech decoding first and second language performances as well as by better English reading comprehension results and faster average reading speed. Regarding the same variables of the two distinctive groups within each age-group of pupils in the mother tongue assessment, there was an interrelation between the means of the reading speed and the errors occurring while reading aloud the text, but there was no such relationship between the reading comprehension results and the quality of the reading skills.

From the two groups with different ages but who had studied English for the same number of years (4/4 and 6/4), the older ones’ reading comprehension performance was proved to be much better in the mother-tongue assessment. However, the foreign language data showed only a slightly better mean value of the older pupils. The quantitative figures also showed that some of the results were different in the two languages; that is while the elder pupils (6/4) scored better in the mother tongue (faster speed of reading and less mistakes made while reading aloud) the younger pupils were more successful in the English text decoding regarding both variables.

(j) Concerning the relationship between the reading speed and the reading comprehension performances of the sample, it was found that the faster speed corresponded with a weaker performance in text comprehension by each examined age-group, so my hypothesis made before the research was not proved. Regarding the 4 groups three groups showed the same interrelations in the mother-tongue and the foreign language test except for one of them (6/4) when these variables were inversely proportional to each other.

(k) Qualitative analysis of the reading skills showed that most of the errors committed by the pupils in both languages belonged to the category of the acoustic-motoric error type. The most frequent type of errors occurring during the mother-tongue reading aloud, was the repeated trial (of reading the same part of the text), with the English assessment pupils tended to exchange sounds. Besides that, quite a few number of errors were documented with sound
or word omission or insertion in both languages. Within the foreign language sound exchanges, pupils made changes such as uttering the written English words according to the Hungarian rules (cf. the violation of the principle of ‘different ways of writing and spelling’) realised in single or multiple sound changes. This implies that the ability to use the grapheme-phoneme correspondence in the foreign language did not function well in either the second, fourth or the sixth year of the English studies in the sample. Therefore a more effective methodological consideration in the reading instruction of the foreign language might be needed.

(l) The statistical analysis also proved that in nearly all cases, the years spent on the English studies and the language (first or second language) had a significant influence on mother-tongue and foreign language speech perception and speech comprehension as well as the reading comprehension performances and the reading speed mean values. However, the age of the subjects was not significant regarding the results of any of the tasks tested.

(m) To discover other types of interrelations between the variables examined in the mother-tongue and the foreign language assessment, different types of relationships were found by the correlation analysis regardless of the language phenomena (L1 or L2). Due to this statistical analysis, it was proved that the fast and the effective way of lexical assessment of all the subjects had a significant influence on the functioning of their lower- and higher-levels of speech decoding mechanism, the related sub-processes of speech perception (serial and visual perception) as well as on the reading comprehension performances. Furthermore, according to the interrelations found by the statistical analysis regardless of the language phenomena (L1 or L2) neither the functioning of the phonetic and phonological level, the related sub-processes of speech perception (serial and visual perception) nor the auditory sentence comprehension results showed a significant correlation with the reading comprehension performances of the subjects. However, the previously detected interrelations between the reading comprehension performances and the functioning of the acoustic and the syntactic, semantic and association levels (cf. the identification of words masked by white noise and the auditory sentence comprehension) were further proved.

5. Conclusions

The quantitative and qualitative analysis of the speech decoding and reading processes of the subjects (within the distinction of age-groups, length of time spent on their English studies, and languages) raised several issues, discussed below.

(1) The demand on the stabilization of the mother-tongue perceptual mechanism for the successful development of the foreign language speech decoding system

When learning the first foreign language children start to familiarize themselves with a language having slightly or greatly different phonetic basis than their mother-tongue’s, it is not negligible what kind of mother-tongue speech decoding mechanism teachers can build on, as only with well-functioning speech perception processes are pupils able to perceive and identify as well as to pronounce the sounds and sound units of the foreign language. Moreover, the speech perception processes can influence the functioning of the speech
comprehension system. The faulty mother-tongue speech decoding mechanism of the 10- and 12-year-old primary school research subjects draws our attention to the fact that even the typically developing children have some problem in some areas of these processes. The lagging behind or the not fully independent functioning of some of the speech decoding levels can affect among others the visual decoding and therefore the reading comprehension processes. The difficulties might be more significantly observed in the foreign language speech decoding and the reading processes. Consequently, learning a foreign language without the adequately developed mother-tongue perceptual basis cannot be so effective, as the underlying mechanisms of the two languages seem to be interdependent. Difficulties in perception and comprehension can be increased by the background noise that can be experienced at nearly all stages of life. Therefore the development of children’s mother-tongue speech decoding system should be of top priority not only in the lower but also in the higher sections of the primary school. Pupils could arguably be helped in the area by incorporating some tasks for development into the everyday class activities such as reciting a short poem, a story read aloud by the teacher or playing a memory game with the sounds of different words.

Besides the influence of the mother-tongue speech decoding processes on the foreign language speech perception and speech comprehension mechanisms during the analysis of the research results, it came up several times that these interrelations could not only be one-way, since it can happen that after a certain amount of time the foreign language processes can influence the same mother-tongue processes (cf. Cummins 1979; Odlin 1989; Lengyel, 1996; Lightbown–Spada 2006). This implies that is not only the mother-tongue speech decoding system that can have a positive or a negative effect on the functioning of the foreign language speech decoding mechanism, but the foreign language speech perception and comprehension can also influence the similar or different processes of the mother-tongue. This statement has not fully been supported by the research analysis as the majority of the significant correlations found between some of the variables were weak, and by interpreting the results other background factors regarding the subjects had to be considered as well. To conclude, I think that in the foreign language speech perception disorders not only the foreign language but also the mother-tongue processes have to be developed.

**2) The importance of the oral development in the initial stage of foreign language instruction**

The foreign language pedagogy at the millennium showed that in the Hungarian public education system the foreign language instruction had not been put into practice in a unified way. Instruction was not always adapted to the state of development of the children in focus. Regarding early foreign language instruction, oral development has a top priority which would ideally last for one or two years. This period should provide children enough time to tune to the special features (unique sounds, word or sentence rhythm, intonation etc.) of the foreign language through the acquisition of songs, rhymes, isolated words, or language chunks which develop the speech perception system in a global way. Unfortunately, in practice it can happen that the period of the initial oral development is shortened drastically, and the oral skills development is done nearly parallel to the written skills development. However, the “use of written records is not the top priority of the early foreign language development” (Kovács 2009:77). This can also be controversial as the mother-tongue reading and writing skills of most children in the lower-primary school years, are not well enough developed for the foreign language (very different from that of the mother-tongue) to build on them in a stable way. The results of the dissertation proved that the 10- and 12-year-old pupils’ mother-tongue speech decoding mechanism and reading skills did not work perfectly,
so they were not able to provide a good basis for supporting the foreign language written system different from the Hungarian. Therefore the initial stages of foreign language development should focus on oral skills for longer and postpone a focus on writing and reading skills development until the mother-tongue processes have strengthened, till the age of 9 or 10. For the initial stages of the use of written records, course books designed especially for Hungarian children might be used, in which the step-by-step written skills development is provided by a method relevant to the foreign language system or one which contrasts the unique characteristics of the mother tongue with the different features of the foreign language. Within the national course book market, it might be advisable to analyse the methods used for the reading instruction of learners of English as the foreign language. The demand for examining how efficiently the foreign language reading skills are developed in practice, as well as for proving the necessity of a longer initiation phase of oral development would need further longitudinal research.

(3) To popularize the early foreign language programmes built on the flexibility of the articulatory basis

In my research the comparison of the results of the two examined groups of different ages with the same length of time spent on their foreign language studies, the analysis showed that the pupils who stated learning English at a younger age had slightly better results in more cases regarding the capacity of the mother-tongue short-term verbal memory, certain levels of the English speech perception and speech comprehension processes, the reading speed and the reading comprehension performances in the foreign language assessment than the older ones. However, the differences between the results of the two groups were not significant; further research is needed to explore whether the earlier starting age was the factor that had an influence on the speech perception mechanism of the younger ones or other (cognitive, sociolinguistic, motivational, psychic etc.) factors could have been responsible for the results mentioned above. (The analysis of these additional factors relevant for the sample is going to be done next.)

Regarding foreign language teaching, other types of programmes promoting the development of the foreign language perceptual mechanism and the skills development built on the speech decoding mechanism would be worth considering. This can be carried out in different ways. If the facilities are provided, the potential advantages of the early foreign language instruction should be exploited. The most important factors to consider are as follows: a high flexibility of the articulatory basis; the indirect, playful way of acquiring the foreign language; inner motivation; a longer time given to develop language awareness and getting enough language learning experience. From the practical point of view it is also implied that the foreign language instruction started at a relatively early age is an important factor in having better results at school as it stimulates children’s intellectual activity, widens their horizon and opens up their mind. According to Bognár (1997) getting in touch with another language than the mother tongue at a relatively early age cannot only rival with the command of the first language but can also help develop the mother-tongue awareness. Regarding how to address early foreign language instruction in practice, I think the bilingual language learning programmes in primary education (cf. in more detail Kovács 2002, 2006), as well as the spreading and adoption of the basic principles of the language awareness programmes (cf. i.e. Candelier 2000) and the experiences gained through the activities²

² activities developing metacognitive skills such as comparing different languages in order to find similarities and differences between their oral and written forms (cf. Hawkins 1984, 1999); ‘tuning the ears’ to perceive and discriminate different sounds of speech; getting learners familiar with different language varieties and dialects (cf. Lőrincz 2002)
providing the development of the speech perception and speech comprehension mechanism and incorporating them into the practice of teaching English as a school subject might result in a positive change.

(4) The need to explore the problem areas of the foreign language speech decoding processes, the language skills that build on these processes and to provide a direct and effective development

The strengthening of the first language perceptual basis is essential for the effective development of not only the oral but also the written skills, as it provides a reliable basis for the ability to discriminate the phonemes of the mother-tongue and the second language as well as an effective acquisition of the grapheme-phoneme correspondences slightly or significantly different from those of the mother tongue. The collection of tasks introduced in the last chapter of the dissertation aims to develop the different levels of the speech decoding system as well as better functioning of the short-term memory processes and a more effective activation of the mental lexicon. The tasks also help developing proficiency in the visual decoding processes and in the complex skills of reading comprehension. It is essential that a direct development of speech decoding processes should be highlighted not only at the initial phase of language learning but also through the whole process of language learning. Before direct development, it is advisable to diagnose the difficulties occurring at certain levels of the speech decoding mechanism in all cases. For the assessment of the English speech perception and speech comprehension abilities of the children the extension of the British English version of the GMP test battery with one task (visual perception) provides further research more chance to contrast their results with those found in the study.

The reading comprehension skills are based on an adequate level of the decoding processes and the well-functioning of the word recognition strategies. From a diagnostic point of view, it is advisable to assess the actual level of the reading skills regularly and to explore the problem areas in order to provide an effective development. Regarding the analysis of the areas of development, the present research helps by providing a unique systematization of errors occurring during the first and second language reading process which also makes it possible to compare the characteristics of the most frequent errors committed in both languages. Besides the need for development of the decoding processes, the continuous expansion of vocabulary, general knowledge and the multiple ways of teaching the use of active strategies necessary for higher-level text comprehension (such as exploring grammatical meanings, asking questions, making summaries, critical text analysis) are also essential for developing learners’ reading comprehension (cf. Pressley 2000). Through the process of the acquisition of the strategic skills, not only the deficits of text comprehension but also the deficiencies of language acquisition in the long run can be corrected (Adamikné Jászó 2006; Csíkos–Steclács 2006). When learning the first or second foreign language, it is also worth exploiting the ‘transfer bridges’ between the languages in point (Boócz-Barna 2010), and also the similarities of the oral and written forms of the mother tongue and the foreign language, and to develop the language learner’s metacognitive and strategic competence according to the contrastive approach. The detailed exposure of the deficits in theory and their direct, systemic and step-by-step development in practice can help improve the efficiency of foreign language learning of young learners.
During the analysis of the research results several questions were arisen.

(i) To what factors can we attribute the differences in the foreign language speech decoding and reading comprehension performances of the children of different ages but the same length of time spent on learning English as a foreign language?

(ii) To what extent can the development of the foreign language speech perception and comprehension processes influence the functioning of the similar processes of the mother tongue?

(iii) What was the reason of not finding any interrelations between the speech decoding processes of the examined languages and the foreign language assessment of the word association in writing; in spite of the fact that during the analysis – regardless of language phenomena (L1 or L2) – significant correlations were found between the lexical access subtest result and nearly all levels of speech perception and comprehension?

(iv) Further research is needed to explore the relationship between the functioning of the mother-tongue and foreign language reading skills as well as the reading comprehension performances of both languages by using similar kinds of text for the assessment.

(v) Furthermore, the research results showed that the foreign language reading comprehension performances were not significantly influenced by the number of years (in the present case after four years) spent on English studies at school, which raises quite a few questions especially regarding language pedagogy.

(vi) Finally, I found that from the 4 test groups, the older group of pupils who had spent the same amount of time studying English as the younger group of pupils, committed fewer errors than the younger pupils when reading aloud an English text. Regarding this result it might be worth investigating whether the better decoding processes can be contributed to the positive consequence of the possibly more well-established oral skills, in spite of the fact that the younger ones might have been given less written input during their foreign language studies than the elder ones.

6. References


Publications related to the topic of the dissertation


In press: