Reeducational exercises for the progress of eye movements –comparative study realized at German and Czech children

(scientific paper)

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Annotation: *The contribution informs about realized survey which took place in 2015 at children of German and Czech nationality. In both groups children with diagnosed dislexia and also children without any diagnosed fading disorders were represented. To measure the quality of reading we chose selected types of exercise focused on stimulation of eye movements from the publications Exercise for the progress of reading (Svoboda, 2012)and a German version* Übungen zur Entwicklung des Lesens (Svoboda, Dömischová, Lacková. 2015).

The aim of the research was to verify the validity of assumption if there is an existence of similar troubles of German and Czech schoolchildren when doing reeducational work with selected exercises, primarily at children with dislexia and also those without diagnosed dislexia. Secondly the aim was to describe detected oddities and to specify most frequent mistakes. The research was crowned with an analysis of particular exercises and with suggesting of particular methods of working with them.

During the research qualitative and quantitative approaches were changed. Quantitative strategy was chosen at comparing of coping of particular exercises in Czech and German language at children with diagnosed dislexia problems. Testing and structured interview were used. Qualitative approach was chosen at an analysis of particular exercises and at a description of detected oddities and specification of most frequent mistakes.

Keywords: *oculomotor movements, reeducational reading exercise, dislexia*

1 Introduction

The realized research was supported by a set of reeducational exercises which were published in the Czech Republic, in the Slovak Republic, in Austria and in Germany.

These exercises due to their exact aims are meant for the stimulation and specification of oculomotor movements used for reading and they are used by readers – beginners and also by those who suffer from dislexia as a reeducational utility in the initial period of proper reading practice. Elementary base of types of these reeducational exercises were created by the author of this contribution. The author conceived these exercises as supplemental reeducational material suitable especially for children of younger and older school age who were diagnosed with lower quality of oculomotor movements – e.g. by means of a test OZOP – T-256 (Svoboda, 2003).

Presented exercises were published in the Czech and Slovak Republic repeatedly by a publishing house Portal. This type of an exactly aimed reeducation became enormously popular with children, parents and teachers as well.

A present aim of the author and his colleagues who participated in the preparation of foreign-language versions of the presented exercises is to spread this offer also to other European countries. A premise of the realized research was to prove the fact that also at work with foreign-language exercises children struggle with similar or the same problems as Czech children do. In order to find out and compare presumed specifics the authors decided for the comparison of reeducational value of German and Czech exercises. This choice was influenced by relatively easy availability of the found German school and also by the fact that the local teachers were very accommodating and enabled the author and his colleague to realize the qausiexperiment. During the searching and the first email contact we also asked if the school reeducate children with dislexia problems as we wanted to include them in our survey. Our aim was to gain relatively extensive group of children with reading problems, however we did not include in our survey children of the 1st year because this developmentally youngest group is only in the initial learning stage of reading – syllabication. We did the same when searching for a Czech school.

2 Choice and compound of tested exercises

At the choice of tested exercises we had an ambition to include all their basic types in them. At this choice we also had to take into account the difficultness of particular exercises and to assign an adequate group of readers. For each year we chose 4 exercises of various types, the first of which was used as a sample one and the three others we measuered in terms of our quasiexperiment. When comparing the fruitfulness of German and Czech readers we also tried to use as similar and comparably difficult exercises as possible. Therefore we preferred exercises with identical solution (e.g. the brand of a car – Subaru). Furthermore we took into account the total number of letters of a searched word and we also assessed its general acquaintance.

For better illustration we mention an example of one type of an exercise from Czech and German version which we used in terms of our survey.

Picture 1: A teaser of analogical exercise

Přípravná cvičení **Čtení podle obrázků**

1) ⧖⧖

Pouze jedno z aut skrývá název značky. Napiš ji.

Vorbereitungsübungen 4a **Lesen nach einem Bild**

1) ⧖⧖

Nur hinter einem Modell der Fahrzeuge verbirgt sich eine Automarke. Schreibe diese auf.

Translation:
(The name of a car is hidden in only one car. Write it).

The note:
⧖⧖ – difficulty

Both versions of the exercise always hide one identical and to solve them is approximately identically difficult.

When evaluating we used a following system: A pupil who was successful and managed to solved the exercise at the first attempt got 2 points. A pupil who did the same with some mistakes or with a little help got 1 point and a pupil who failed got no points.

3 Realization of the research itself

47 pupils participated in the research, 23 of them were from German school and 24 from Czech school. The percentage of the boys representation in both groups was 52 percent and 58 percent.

Another subject matter was the age of the pupils. 6 pupils from the second, fourth and fifth years of Czech and German school participated in the research, in the third year the number of surveyed children was almost identical – 5 children at Czech schools and 6 children at German ones.

Table No.1 Summary of surveyed children at Geman and Czech schools

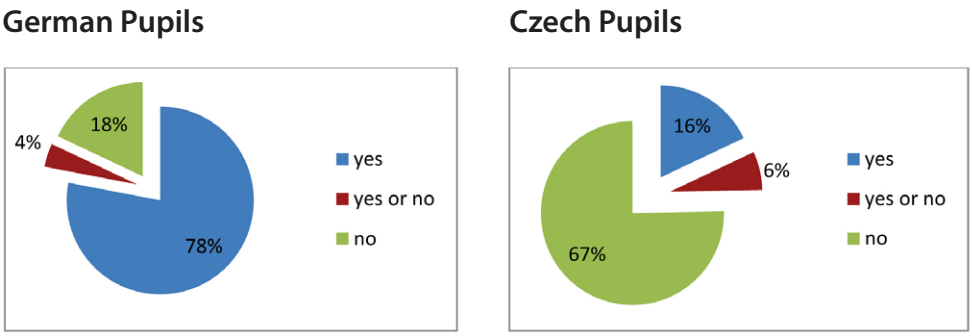
Class	German Pupils		Czech Pupils	
2.	7 year	8 year	7year	8 year
	4	2	3	3
3.	8 year	9 year	8 year	9 year
	1	4	2	4
4.	9 year	10 year	9 year	10 year
	2	4	1	5
5.	10 year	11 year	10 year	11 year
	3	3	0	6

Not even one of surveyed children had postponed school attendance, the age of children in all 4 groups was almost identical.

Our research was also focused on assessment of performance of children with dislexia. In our sample there were 22 percent of children (5 children) with dislexia at German school and 33 percent (8 children) at Czech school.

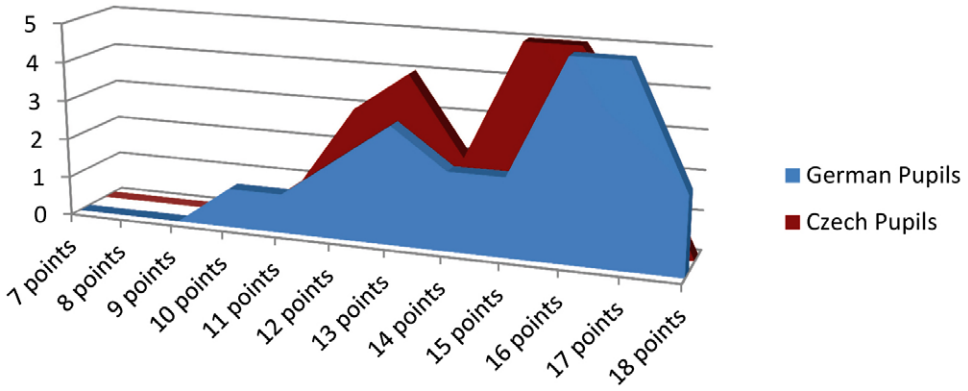
Before the beginning of the survey we asked each child individually if they liked reading. Here we came across bigger differences between both groups of different nationalities. Following graphs show the gained answers.

Graph 1, 2: Popularity of reading at Czech and German pupils



Afterwards we continued with a planned experiment when we measured the performance of Czech and German children at solving of particular reeducational exercises. A following graph proves the existence of minimal differences between both groups of observed readers.

Graph 3: The number of gained points at both groups of readers



Also the check numeric processing of the average number of points has proved only a minimal insignificant difference between both observed groups. Total fruitfulness of German pupils was 81 percent, total fruitfulness of Czech pupils was 79 percent. This result let us presume that both groups are mutually homogeneous. Therefore we could proceed to comparison of performance of Czech and German children who were diagnosed with dislexia and we tried to measure their performance with the performance of an intact groups of children without any dislexia diagnose. More significant differences appeared here.

We made the measurement of performance of total 13 children diagnosed with dislexia (N = 13, 8 Czech and 5 German children). The total average number of gained points at a mixed dislexia group was 12.9 points, at an intact mixed group it was 15.4 points (N = 34 children, 18 German pupils and 16 Czech pupils).

We set a following hypothesis:

H1(a) Observed children diagnosed with SPU – dislexia achieve at solving of selected reeducational exercises much worse results than children of a check group.

The calculation with the help of Student T-test has proved that there is a significant difference in performance between children with dislexia and those from an intact group. The outcome of the test exceeded a critical value (T = 3.52, critical value = 2.014, N = 47). The validity of an alternative hypothesis was proved.

We also presumed that the performance of all observed German children at solving of reeducational tasks will be approximately the same as the performance of Czech children. To verify this assumption we set a null hypothesis and tried to verify its validity by a relevant calculation.

H2(o)Observed Czech and German children will achieve approximately the same results at solving of reeducational exercise.

Average result of Czech children was 14.1 points, German children achieved the value 14.9 points. Student test proved the validity of this null hypothesis (T = 1.03, critical value = 2.014, N = 47).

In the following part of our experiment we focused on the assessment of difficultness of particular exercises. Our aim was also to find out if there are significant differences between the performance of Czech and German children in terms of particular types of reeducational exercises. Firstly we sorted exercises based on difficultness and we made a summary of achieved points at both groups of pupils.

The costing with the help of Spearman´s coefficient of ordinal correlation showed a weak dependence between both sequences (rs = 0.104). The performance of German and Czech children corresponded in the difficultness rank only in case of three tasks. Exercise 7 was for both groups the easiest one, on the other hand Exercise 3 was the most difficult one. Exercise 9 appeared to be of a middle difficultness. The rank of difficultness was very variable and non-correlational at other exercises.

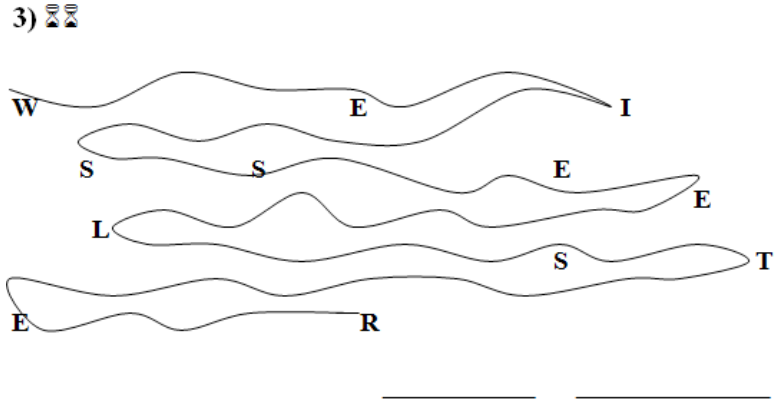
On the basis of these outcomes we tried to explain the existence of proved differences and therefore we focused particularly on exercises which placed on the order ladder of both groups at very different positions.

Next picture is depicting Exercise 1 was in the German version one of the most difficult exercises and in the Czech version one of the easiest ones. (In the rank of difficultness 11th position at German children and 2nd position in the rank of difficultness at Czech children).

Table 2: Ranked Czech and German exercises according to the number of achieved points.

	A type of exercise	a	b	c	The average		A type of exercise	a	b	c	The average
Czech version	**3**	1,7	1	0,3	1,00	German version	**3**	1,5	1	1,5	1,33
	5	0,7	1,5	1,8	1,33		**1**	1,8	2	0,8	1,53
	11	1,3	1,2	1,5	1,33		**10**	1,5	2	1,3	1,60
	2	1,8	1,5	1,3	1,56		**12**	1,5	1,5	1,8	1,60
	9	1,8	1,7	1,2	1,56		**9**	1,3	1,8	1,8	1,63
	12	1,8	1,7	1,3	1,60		**2**	2	1,3	1,7	1,67
	8	1,5	1,5	1,8	1,61		**6**	1,2	2	1,6	1,67
	4	2	1,7	1,5	1,72		**11**	2	1,3	1,7	1,67
	6	1,7	1,8	1,7	1,72		**8**	1,8	1,8	1,7	1,77
	10	2	1,5	1,7	1,73		**4**	1,8	1,8	1,8	1,80
	1	2	1,8	1,5	1,78		**5**	1,8	1,6	2	1,80
	7	1,8	2	2	1,94		**7**	1,8	2	1,8	1,87
	The total average	1,68	1,58	1,47	1,57		**The total average**	1,67	1,68	1,63	1,66

Picture 2 Exercise 1c – German version

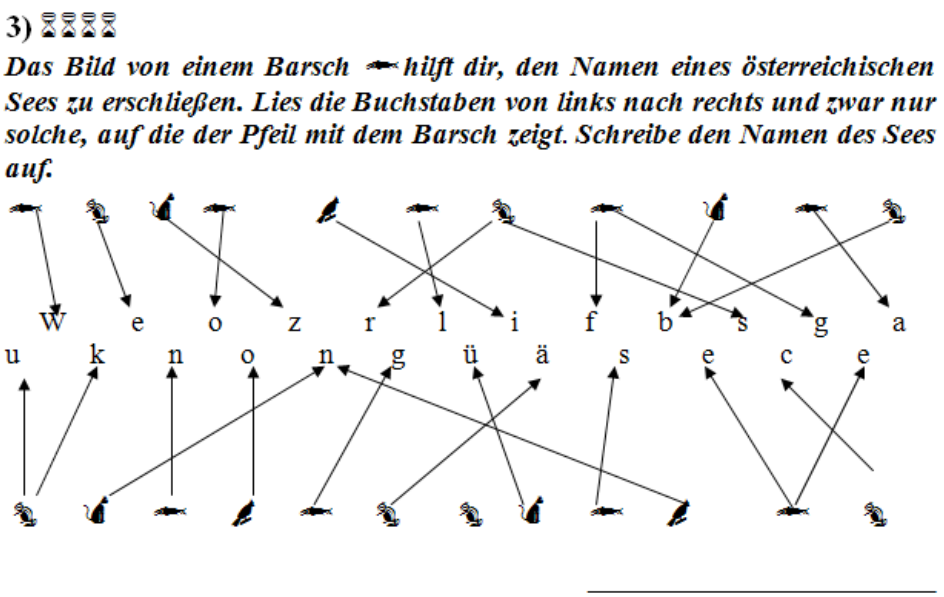


German children had probably a problem with a synthesis of searched words as they have never heard of River Weisse Elster. A very frequent version they were

creating were words such as Weis See Lster which, when read in German, sounds really distinctly. On the other hand the Czech version did not include any bigger "captiousness".

Further more significant problems vere present at solving another task which is considered to be more difficult. In the publication Übungen zur Entwicklung des Lesens (page 29) it is marked with a sign 4 sandglass. Also during our survey it came to the light that children had significant problems when solving it.

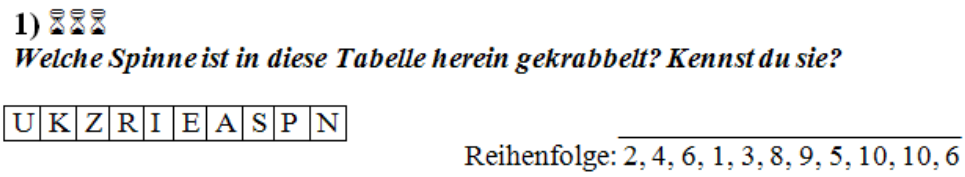
Picture 3 Exercise 10 c – German version



In this exercise the task of the children was to read the name of Austrian lake Wolfgangsee and to orientate themselves when searching with the help of a symbol of a fish. The most mistakes appeared at symbols which were composed of two letters. Many children used crayons or highlighters, most of them rewrote the searched word with every single letter on an ancillary line. Czech children were a little bit more successful at solving a similar task. However, in this case there were rather different results, which was probably caused by a variously difficult double solution.

The next type of the exercise was comparable as regards the level of difficultness at both groups of observed children.

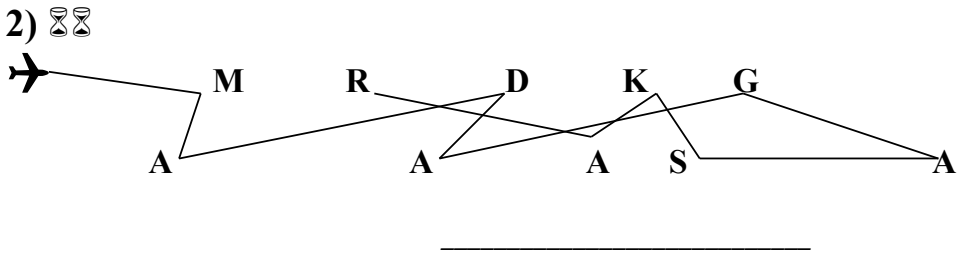
Picture 4 Exercise 6A – German version



This task was rather time consuming and for slower pupils it was therefore "a hard nut to crack". For quicker undrestanding we used an illustrative teaser. Despite this some mistakes often appeared during the process of solving it. We characterised these mistakes as mistakes caused by inattentiveness. We also observed that children correctly solved the first and mostly also the last letter whereas the most mistakes appeared in the middle of an unscrambled word. Some children also proceeded with the help of an grapheme which they had already written before. For instance the letter Z, hidden above the number 6 they used as an duplicate when writing it as a final letter of a word.

Furthermore we focused on an exercise with crossings of ancillary lines. We found out that these crossings cause the solvers significant difficulties.

Picture 5 Exercise 3b – German and Czech version



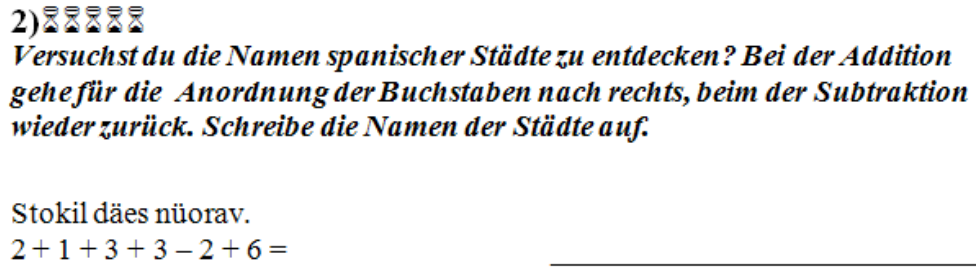
We were observing the solution of this task and we found out that the biggest problems at both groups of children appeared in an area where there are crossings of ancillary lines – at letters D and K. In this place both Czech and German children read some letters twice. Therefore they distorted the correct word so instead of MADAGASKAR there was a word MARDAKGASKAR. One pupil even read the letters – on the first line from the right to the left and the other line from the left to the right. Therefore the result was a word MRDKGASAAA.

We also verified the efficiency of our chosen ancillary strategy which we discovered during the process of solving the tasks. We noticed that it helped both German and Czech pupils when they highlighted by means of colourful ancillary lines when

solving the tasks. Thanks to the colourful resolution children could better realize which part of the word they were in there were fewer situations of changing the order of particular words. This fact should be taken into consideration if other publications of reeducational exercises will be issued and should be cited as a recommendation in the introduction.

We analysed the next type of an exercise (picture 6) also in the Czech version. The resulting words were identical – TOLEDO. When solving it hepled children a lot when they could underline in color or mark with tittles. Despite doing so many children were not able to solve a searched word without our help. However we can state that this type of exercise was attractive for both German and Czech pupils and they really enjoyed the solving of the word.

Picture 6 Exercise 11b, German version



4 Conclusion

The described research was done in order to verify the validity of two basic hypotheses which were set on the basis of logical assumptions and gained knowledge stemming from the longtime reeducational work with children with dislexia and also with beginner readers. In the first case the authors presumed that reeducational exercises intended for the stimulation of eye movements will be found suitable also as a diagnostic utility because the results of both German and Czech children with dislexia problems will be at solving of selected exercises much worse than the results of children from the check group. This wasc proved. The aim of the authors was also to prove that reducational exercises have the utility inside the conception of these exercises. In other words that the system of searching for hidden solution with the help of fine oculomotor movements will be beneficial for the stimulation of a proper eye function regardless a language (German or Czech). The validity of this assumption was also proved. Another aim of the authors was to find out if there are some specific differences in particular types of reeducational exercises which would be able to reflect the specifics of both languages. It was found out that differences in

the difficultness of exercises really exist and that they correlate to some extend with the specifics of Czech and German langauages and probably also with sociocultural backgrounds. These differences are very variable, however, because of their polarity they have no significant profile. Their character therefore cannot claim that given exercises were on the whole variously difficult for German and Czech children.

If these exercises for reeducation and development of eye movement in Czech and German speaking countries are used, it is probable that their usefulness for the stimulation of eye movements will be provable and comparable.

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