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Dyslexia and Traumatic Experiences

PL ACADEMIC RESEARCH

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Preface

This book is the seventh volume in the series "Studies in Educational and Rehabilitation Psychology". It contains selected contributions from the international conference "Dyslexia and Traumatic Experiences" organized by the team members of Educational and Rehabilitation Psychology, Institute of Psychology at the University of Leipzig. It took place on 5 and 6th of December 2014 in the University of Leipzig, Germany.

The purpose of this book is to strive towards fostering a scientific exchange that promotes emergence of synergy effects and scientific progress. The authors of the book articles are from Indonesia, Sri Lanka, Morocco, Sudan, South Africa, South Korea, Iran, China, Portugal, and Germany. The interdisciplinary character of this book is representing in contributions of scientists from psychology, special education, linguistics, genetics, and neuropsychology.

The main topics of the book are structured in four chapters. They are related to dyslexia with some new perspectives on this old phenomenon, traumatic experiences, intervention methods, and some special methodical problems, particularly in qualitative research methods.

The authors of the book articles, the participants of the workshop, as well as the editors were very grateful for the sponsorship of the DAAD for scientists from Sri Lanka.

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Chapter 1
Dyslexia

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Dyslexia – New Perspectives on an Old Phenomenon

Abstract. The article aims to the question what is new until the last two decades in the dyslexia research and in the assessment. Some new aspects and some lines of progress will be discussed regarding the genetic basis of dyslexia, the hemispheric dominance, and the visual-spatial abilities of dyslexic individuals in different ages.

Keywords: genetic basis of dyslexia, hemispheric laterality, visual-spatial abilities.

1 From family and twin studies to the analysis of the genetic code

Family and twin studies indicated over decades a strong hereditary disposition of dyslexia. The studies showed that 40 % of the siblings and parents of a dyslexic were also having dyslexia (Grimm, 2001; Wilcke & Boltze, 2010). In twin studies, the genetic determination of dyslexia was highly estimated (about 60 %; Olson, Forsberg, & Wise, 1994). But the critical point regarding these studies is that the non-measured impact of family members, of cultural and natural environment were not be considered.

Linkage studies are a way to narrow the genomic region, where relevant disease genes are expected. Several genes have been linked to dyslexia, including DCDC2 and KIAA0319 on chromosome 6 and DYX1C1 on chromosome 15 (e. g., Grigorenko, et al., 1997). But, these findings are not always replicated. Molecular studies have linked several forms of dyslexia and different cognitive processes to genetic markers. However, no single gene is definitively implicated in dyslexia. Linkage analysis showed until now that at least nine different chromosomal regions could be identified where several disease genes are suspected. Those regions are connected with dyslexia, and are called DYX regions (Witruk & Wilcke, 2010).

Association studies focused on genes previously identified in linkage studies as potential candidates and compared different populations (i.e., dyslexics vs. controls). Most relevant are the analysis of SNP (Single Nucleotide Polymorphism), which means that a single base at a certain position in the genome is different in some individuals, and that these individuals comprise at least 1 % of the population.

Wysocka, Lipowska, and Kilikowska (2010) could show that dyslexia "seems to be a complex trait determined by number of genes, with small to moderate effects on the specific phenotype, involving various factors such as heterogeneity, incomplete penetrance, phenocopy, or oligogenic inheritance. Based on combined linkage and association analysis using both qualitative and quantitative phenotypes, the multiple regions (DYX1-DYX9) on chromosomes 1, 2, 3, 6, 11, 13, 15 and 18 have been reported likely to contain genes contributing to dyslexia. Most recently, four candidate genes (DYX1C1, KIAA0319, DCDC2, ROBO1) have been identified as associated with dyslexia" (Wysocka et al., 2010). Therefore, it is possible that one person has some genetic risk variants and some protective variants that compensate each other. Depending on the number and type of genetic risk variants, a mild, moderate or severe type of dyslexia is developed (Witruk & Wilcke, 2010).

2 From the assumption of left handedness to hemispheric laterality profiles

The former assumption of left handedness as a characteristic of dyslexic individuals could not be confirmed in the last decades. Several empirical studies found a weak, combined laterality, and hemispheric coordination problems among dyslexic children. Larsen, Höien, Lundberg, and Ödegaard (1990) found a reduction of the usual asymmetry of the left and right Planum Temporale as well as a high correlation of mixed handedness and phonological disorders. Stein (1994) explained dyslexia by the impaired magnocellular functions and the impaired hemispheric specialization and lateralization. Sebastian and Yasin (2008) showed in a Mismatch Negativity experiment with compensated dyslexic adults that the lateralization of the auditory system can be less specialized as a result of impaired hemisphere dominance.

Our research investigated the laterality profiles in dyslexic and normal-reading children in connection with their phonological awareness (Schulz, 2013), their intelligence profiles and reading and spelling performances (Unger, 2007). Two studies of laterality effects (hemispheric dominance effects) on hands, eyes, and legs in dyslexic children were discussed. It could be confirmed our assumption of weak and combined hemispheric laterality in dyslexic children and its motoric and sensory behavioral consequences on preferences of hands, eyes, and legs in dyslexic children. The individual laterality profiles were compared between dyslexic and normal reading children on the basis of discriminate and cluster analysis. The results show a dependency on dyslexia, gender, and a correlation to the phonological awareness.

3 Visual-spatial abilities: Deficits versus strengths?

The beginning of dyslexia research is connected with the assumption of special, and strong visual impairments in the sense of "congenital word blindness" (Orton, 1925) and the "Raum-Lage-Labilität" (Schenk-Danzinger, 1991). In several studies, visual deficits were found in dyslexic individuals. In most of the studies including dyslexic children visual deficits could be confirmed, such as Lipowska, Czaplewska, and Wysocka (2011), whereas other studies (e.g., Graeve, 1997), found no significant differences or could show advantages in the dyslexic individuals (Witruk, 2011, 2015). Therefore the question can be generated regarding the compensation effects during the life span of dyslexic individuals or visual-spatial strengths which can be connected with dyslexia.

Deficits in script acquisition can be the expression of a global, holistic processing style which can have advantages within several other visual requirements compared to reading and writing (Brunswick, Martin, & Marzano, 2010; Károlyi, Winner, Gray, & Sherman, 2003). This global, holistic processing style can be based on the reduced hemispheric asymmetry (Larsen, Höien, Lundberg, & Ödegaard, 1990). Our research is caused by the controversial findings regarding visual-spatial abilities in dyslexic individuals and the clear link to gender dependency of these abilities.

In three experiments, we used visual tasks which can be solved by different cognitive processing styles. In contrast to the analytic processing style, the global, holistic processing style is possible with assumed advantages for the accuracy and the reaction speed. We asked like Tafti, Hameedy, and Baghal (2009) and Wolff and Lundberg (2002) about the advantages in the sense of talents or compensation products of dyslexic individuals regarding visual-spatial abilities. We assumed that compensation products are developing over the school time and are completed in the adolescence. Therefore, we integrated dyslexic and control individuals from different age groups (children with a mean age of 10.26 years, adolescents with a mean age of 17.16 years and young adults with a mean age of 23.04 years) and from different orthographic background (Cantonese ideophonetic, Arabic segmental, and German alphabetic script). The results could confirm our assumption of visual-spatial advantages in dyslexic individuals in dependency of gender, age group, and the type of orthography. The advantages were clear in the group of adolescents and therefore they can be interpreted as compensation products (Witruk, 2015).

One of the conclusions of these findings led to the development and application of virtual realities for the assessment and treatment of dyslexic individuals on the basis of their visual-spatial strengths. Attree, Turner, and Cowell (2009) could show

that the visual-spatial strengths of dyslexics are to observe in the age of adolescents, not only on the basis of traditional paper and pencil test (here used British Ability Scale, BAS II), but also on the basis of virtual reality tasks. They constructed a virtual reality test by using Superscape VRT software and could show significant better spatial recognition memory performances among dyslexic adolescents comparing with a control group. The authors conclude that the learning process of dyslexic children should integrate their strengths from the beginning. Using techniques that help them to learn through their strengths can enable successful learning. On this way they expect prevention against strong primary (failures in reading and/or writing) and secondary symptoms (e.g., anxiety, low self-esteem, and low motivation) of dyslexic individuals.

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Emotional Consequences of Children with Dyslexia: An Overview from a Cross-cultural Perspective

Abstract. For more than a decade, the emotional impacts of dyslexia on the lives of individuals have been studied from different aims and perspectives. However, most studies on this topic have been conducted in a single cultural context. This study investigated the cross-cultural differences between children with and without dyslexia, specifically in respect of their anxiety and self-esteem profiles. A total of 124 children with and without dyslexia from Germany and Indonesia participated in this study. They were comparable in age (8–11 year olds), school grade (third and fourth grade) and IQ (> 73). All children were administered an IQ test (CFT-20R) and completed two questionnaires (i.e., Spence's Children Anxiety Scale and The General List of Self-esteem for Children and Adolescent). This study cannot provide significant results for hypotheses proposed. However, weak-medium effect sizes were reported for the effect of dyslexia on anxiety (d = -.21), dyslexia on self-esteem (d = .34) and different anxiety levels of German and Indonesian children (d = -.31).

Keywords: anxiety, self-esteem, dyslexia, cross-culture.

1 Introduction

Dyslexia is a specific learning disability that has a neurobiological origin (Lyon, Shaywitz, & Shaywitz, 2003) and has no significant relationship with IQ (Witruk & Eichhorn, 2012). According to Betz and Breuninger (1993), children with dyslexia may experience what they refer to as the four stages of a *virtuous circle of learning disorder*.

2 Theory

2.1 Dyslexia and emotional consequences

The studies on the role of emotion in academic and reading-writing performance reported that individuals with dyslexia have disadvantages in respect of their anxiety level (Caroll & Iles, 2006; Nelson & Harwood, 2011). In general, children with

learning difficulty reported a lower score of positive well-being, were unhappier and more anxious than their peers without similar difficulties (Casey, Levy, Brown, & Brooks-Gunn, 1992). A meta-analysis by Nelson & Harwood (2011) also reported a statistically significant medium of effect size (d = .61) on anxiety symptom of school age children with learning disabilities. More specifically, studies reported that children and teenagers with dyslexia have a lower level of perceived scholastic competence (Frederickson & Jacobs, 2001), lower level of achievement, effort investment, academic efficacy, sense of coherence, positive mood, and hope (Lackaye & Margalit, 2006), and have more academic, social and psychological problems (Vigilante & Dane, 1991) than their peers without similar difficulty. Over a prolonged period, children who showed high levels of anxiety could have negative educational outcomes such as failure to complete high school or college (Ameringen, Mancini, & Farvolden, 2003; Kessler, Foster, Saunders, & Stang, 1995).

2.2 Culture and anxiety

Hofstede (2001) introduced one dimension called the uncertainty avoidance index as one important factor for investigating anxiety in a cross-cultural context. This dimension shows how culture is dealing with an ambiguous situation, and it is strongly related to anxiety (Hofstede, Hofstede, & Minkov, 2010). This result gives strong evidence that culture is an important factor that should be considered in anxiety research.

2.3 Culture and self-esteem

According to Tsai, Ling, and Lee (2001) in the individualistic culture, people tend to see the self as separate from others. They argued that in this culture, individuals are encouraged to express their uniqueness by engaging in self-enhancement strategy (i.e., presentation of the self as superior to others). On the other hand, collectivistic culture tends to see the self as part of others and, therefore, encourages their member to maintain the harmony of an interpersonal relationship through self-effacement strategy (i.e., presentation of the self as inferior to others). As a result, it is widely assumed, that Westerners view themselves more positively than Asians (Brown & Cai, 2010).

2.4 Hypotheses

Hypothesis 1: children with dyslexia are more vulnerable to emotional consequences such as low self-esteem and high anxiety compared to children without dyslexia.

Hypothesis 2: due to cultural differences, Indonesian and German children develop different anxiety and self-esteem profiles.

3 Method

3.1 Sample

A total of 124 children from Indonesia and Germany participated in this study. The ratio between children with and without dyslexia was 64 (M_{age} = 8.86) to 60 (M_{age} = 9.23). They were comparable in IQ ($M_{IQnondys}$ = 101.09, M_{IQdys} = 97.72. t = 1.45, p = 1.15), gender (boys = 62, girls = 62), and were assigned to either third (n = 57) or fourth year at school (n = 67).

The Indonesian group was represented by the following characteristics: 29 children with dyslexia (M_{age} = 8.93) and 35 children without dyslexia (M_{age} = 8.49), 34 third and 30 fourth year pupils, 28 boys and 36 girls. The German group consisted of 31 children with dyslexia (M_{age} = 9.52) and 29 children without dyslexia (M_{age} = 9.31), in year three (n = 23) and year four (n = 37), represented by both genders (boys, n = 34 and girls, n = 26). The children with dyslexia were diagnosed by qualified psychologists in both countries, and all of the children without dyslexia had no history of learning difficulties.

3.2 Measurement tools

Measurement tools that were used in this study are: General List of Self-esteem for Children and Adolescent (Schauder, 1991), Spence Children's Anxiety Scale (Spence, 1998), Culture Fair Intelligence Test 20 Revision ([CFT-20R] see also: Weiss, 2006).

4 Results

Multiple regressions were conducted to test the hypothesis. Table 1 reports slopes, R-values and effect size (Cohen *d*) of the conducted analysis.

Table 1. Results of multiple regressions

	Slope	R	d
Dyslexia and anxiety	.13	.20	-.24
Country and anxiety	.16		-.31
Dyslexia and self-esteem	-.01	.17	.34
Country and self-esteem	-.17		-.01

Note. Group coded: 1 = children without dyslexia, 2 = children with dyslexia. Country coded: 1 = German, 2 = Indonesia. Interpretation of *d* values: .2 = weak, .5 = medium, .8 = large effect (Cohen, 1988). Negative effect sizes reflect that second group has higher mean than first group.

No significant effects were found in either analysis. Children with dyslexia have relatively similar anxiety and self-esteem profiles compared to children without dyslexia. Country is also not regarded as a significant predictor for anxiety and self-esteem profiles of children in age groups between 8–11 years.

5 Discussion

This current study can neither support the assumption of emotional vulnerabilities of children with dyslexia nor the different anxiety and self-esteem profiles of children from different countries. However, weak-medium effect sizes were found for the effect of country and dyslexia on anxiety as well as the effect of dyslexia on self-esteem. The contradiction of significant test and effect size analysis is recognized as a result of power issue, which should be addressed in the further cross-cultural study.

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Secondary Symptoms and Compensation – Mechanisms of Dyslexic Children

Abstract. This longitudinal-study will continue the investigation of the development of secondary symptoms in dyslexic children, the impact of dyslexia on the self-esteem, anxiety parameters, motivation aspects and behavioral components. The focus of this study is the investigation of the benefit of special dyslexic rehabilitative classes in comparison to integrative classes in Germany. The study includes four measurement points and is still in process. The third measurement point is finished. The research questions are: How do the scholastic surrounding conditions influence the well- being of the dyslexic children and the perceptions and evaluations of the teachers and parents concerning the behavior and emotional expressions of the children? Which reaching method has the best preventative effect? The current results give first evidence for the positive effect of special rehabilitative classes for dyslexic children on their subjective well-being.

Keywords: special rehabilitative dyslexic classes, integrative classes, longitudinal study.

1 Introduction

Reading and writing are the most important competences to take part in the society. Having a handicap in these sectors/fields can cause massive consequences. Especially children with dyslexia are confronted with huge school and social problems. The association of children with learning deficits or disorders is very different in each state of Germany. Special rehabilitative dyslexic classes were established in the easterly states of Germany. But for the last 2–3 years these classes were removed in the eastern part of Germany and still implemented in the state of Saxony. In the states without special dyslexic classes the schooling advancement implied some remedial lessons and "disadvantage adjustment" (e.g., more time to work on reading and writing tests or tasks). And depending on the financial possibilities of the parents there are a lot of private learning institutes where the children can get special help and support. In the state of Saxony, where the special dyslexic classes still exist, children who show massive problems to learn reading and writing during the second grade, are doing a special diagnose period. When the child is diagnosed with dyslexia, he will go for two years in special dyslexic classes. These classes are small groups of 8–12 children taught by special educated teachers. After the two

years the child returns to regular classes for one year and go back to normal school for the fourth grade. In the states without special dyslexic classes, all children have lessons together, independent from their handicap. The main goal in those states is inclusion. The difference between the two teaching methods has to be analyzed considering the background of the theory of the development of secondary symptoms and the past results of Eichhorn (2010, 2012), which showed the positive effects of special dyslexic classes for the well-being of the children.

2 Theory

The theoretical background of the contemporary study is the theory of Betz and Breuninger "Teufelskreis Lernstoerungen" (1998). The authors describe the development of the secondary symptoms of the dyslexic children. This term is based on the model of Valtin (1989). It distinguishes between etiological and phenomenological level. There are primary and secondary causes for dyslexia, like genes and deficits in basic competences (e.g., working memory) and which entail primary symptoms (reading and writing problems) and this involving again secondary symptoms (behavioral and emotional problems). In their "vicious cycle" Betz and Breuninger (1998) present four steps for the consequences of a learning deficit. Destabilize self-esteem, leads to reduce learning motivation and increase anxiety of the affected child, because of the self- attribution of the learning deficit (without knowing that it is a handicap). Further interactions with the social environment and misunderstandings from the parents and the teachers reinforce the self-esteem problems. So the child develops behavioral and emotional conspicuities (e.g., school avoidance, problems in other subjects). If it has come to the last stadium in the vicious cycle, all described processes strengthen and the child as well as his teachers and parents do not expect any scholastic success anymore. The theory of Betz and Breuninger (1998) does not consider that the special dyslexic classes can have an influence or any other preventative effect on the children who have secondary symptoms.

3 Method

3.1 Sample

The first data collection of the study includes the statistics from 207 participants (112 female, 95 male). 44 children diagnosed with dyslexia were taught in special dyslexic classes. 8 children also with dyslexia were taught in integrative classes and 155 children without dyslexia (control group) took part. 33 children were diagnosed with a psychological or physiological disorder and 9 of them had an ADHD.

The first data collection includes results from 192 children questionnaires, 174 teachers' questionnaires and 189 parental questionnaires. The second data collection includes 160 children questionnaires (72 female, 88 male), 146 teachers' and 134 parental ones. The third data collection includes statistics from 143 children (63 female, 81 male). 43 children were taught in special dyslexic classes, 8 children in integrative classes and 72 were in the control group.

The results include 143 teachers and 130 parental questionnaires. There are 123 children who took part from the first until the third data collection. There is a high dropout but also new participants in the second and third data collection. Overall**,** three schools with special rehabilitative dyslexic classes and eight other schools, with regular classes, participated to the study.

3.2 Measurement tools

A longitudinal study, which includes four data collections, was chosen to investigate the development of dyslexic children secondary symptoms. The first data collection was in autumn 2013 with the beginning of the school year. The dyslexic children began their treatment in special rehabilitative classes. The control group and the integrative one started it at the beginning of the second grade. So the study includes two experimental groups (first: children with dyslexia in special dyslexic classes, second: children with dyslexia in integrative classes), and one control group (children without dyslexia). When the data was collected for the second time, it was during the second half of the second school year (for the control and integrative class group) and the second half of the first special dyslexic class year. When the data was collected for the third time it was during the third grade respectively in the second dyslexic class year.

The fourth and the last data collection will be conducted during the beginning of the fourth grade, when the dyslexic class children return to regular classes and treatment.

In each data collection 5 questionnaires were used. Three were for the self-evaluation of the children, to measure self-esteem, anxiety, learning and achievement motivation. One was used for the parents and one for the teachers, to measure their evaluations concerning the behavior, the competences and the internalizing and externalizing symptoms which they observed in their children or students.

The children got child-friendly questionnaires which got another layout to make the reading easier for the children and to increase the answer motivation.

The teachers were instructed how to do the questionnaires with the children. In the first data collection all questionnaires were taken in their original length. For the following data collections the questionnaires were shortened to reduce the

time costs for the teachers and to keep up the participation and prevent drop-outs. Because of the disposed dyslexic diagnose and further disposed special dyslexic classes in Saxony- Anhalt and to find out which child has dyslexia, there was an individual testing of suspicious children with common tests.

Questionnaire for the children. To measure the self-evaluated well-being, the "Angstfragebogen fuer Schueler (AFS)" (Wieczerkowski, Nickel, Janowski, Fittkau, & Rauer, 1973) was used. It includes four scales: one to measure anxiety in general, another also to measure anxiety but during exams, one scale to measure school aversion and a fourth one to measure social desirability. Then, "Skala zur Erfassung der Lern-Leistungsmotivation (SELLMO)" (Spinath, Stiensmeier-Pelster, Schöne, & Dickhäuser, 2002) was used. It measures learning and achievement motivation. And last but not least, "Aussagenliste zum Selbstwertgefühl (ALS)" (Schauder, 1991) was used. This measures the self-esteem in different contexts: school, family and free time activity.

Questionnaire for the parents and for the teachers. To get information about the behavior and the emotional expressions of the children, teachers and parents were asked to answer a questionnaire which measures internalizing and externalizing symptoms. The "CBCL (child behavior checklist 4–18)" (Arbeitsgruppe Deutsche Child Behavior Checklist, 1998) was used for the parental evaluation as well as for the teachers' "Teacher's Report Form (TRF)" (Döpfner, Berner, & Lehmkuhl, 1994).

4 Results

The first calculations to analyze the differences between the groups, show significant interactions between the group and the data collection ($p = .03$). Dyslexic children in integrative classes show a significant lack of scholastic self-esteem compared with the control group (from the first to the second data collection). A simple linear regression analysis shows that the scholastic self-esteem at the first data collection, predicts significantly the self-esteem at the second data collection (*A Rsquare* = 234; $p < .001$). The results of the scale school aversion (posthoc-analysis after ANOVA) show a significant group difference ($p = .04$). Children who are in the control group ($MV = 49.11$ and $SD = 10.07$) presented a more significant lack of school aversion than dyslexic children in integrative classes ($MV = 58.29$ and $SD = 4.35$). This result is confirmed by the Kruskal-Wallis-Test ($p = .022$) and the Welch-Test ($p = .000$). For the second data collection about school aversion, it is the same thing. Significant groups' differences ($p = .002$ and $p = .003$) between control group ($MV = 46.28$ and $SD = 9.25$) and integrative class group ($MV = 59$ and $SD = 6.66$), but also between integrative class group and dyslexic class group ($MV = 46$

and *SD* = 7.67), were calculated with the same analysis and were also confirmed with the Kruskal-Wallis-Test ($p = .008$).

At the moment there is only a descriptive view on the parental and teachers' evaluations. It refers to a difference between dyslexic children in special dyslexic classes and the control group in a way that teachers and parents of dyslexic children report more externalizing and internalizing symptoms than parents and teachers of non-dyslexic children.

5 Discussion

The first results imply the positive effects of special dyslexic classes on the subjective well-being of dyslexic children and the prevention of secondary symptoms. The further development during the future measurement points has to be analyzed.

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