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A Scale of Knowledge and Beliefs about Developmental Dyslexia: Scale Development and Validation

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Abstract

The purpose of this study was to create and validate a scale measuring knowledge and beliefs regarding developmental dyslexia. A four-step procedure was followed to achieve this objective. A literature review generated a preliminary pool of 65 items. A group of 12 university teachers of learning disabilities read the items for content and face validity and offered comments. Based on their comments, some items were combined, and confusing items were changed or eliminated, which left a scale of 50 items, with the response options of true (V), false (F) or don't know (NS). Later, each participant, using a description of the scales, placed each item into one of the three subscales. An item was considered part of a subscale if at least 80% of the sample was in agreement. The scale was pilot tested with a group of 89 teachers. Participants took the full 50-item scale. Based on the item-total correlations, fourteen items were deleted from the scale, resulting in the final 36-item scale. Finally, the reliability for the total scale was found to be .76 using Cronbach's alpha. The three subscales within the scale (general information, symptoms /diagnosis, and treatment of dyslexia) all had moderate levels of internal consistency (Cronbach's alpha ranging .64 to .69). The scale was also practical to use. It allowed a gather a great deal of information about knowledge and beliefs about dyslexia in a brief amount of time.

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1. Introduction

Prevalence of developmental dyslexia in Spain was estimated between 3.2% and 5.9%, depending on the definition used (Jiménez, Gúzman, Rodríguez, & Artiles, 2009). This means that approximately one in five children will likely experience significant symptoms of dyslexia. According to the International Dyslexia Association (2002, 2008), dyslexia is defined as a specific learning disability that is neurological in origin that affects as many as one in five children. Dyslexia is characterized by difficulties with accurate and/or fluent word recognition and by poor spelling and decoding abilities. These difficulties typically result from a deficit in the phonological component of language that is often unexpected in relation to other cognitive abilities and the provision of effective classroom instruction. Secondary consequences may include problems in reading comprehension and reduced reading experience that can impede the growth of vocabulary and background knowledge.

In other hand, a growing amount of research attention has been given to teacher quality, teacher knowledge, and teacher preparation programs. Researchers have focused investigations on understanding the knowledge base of elementary reading preservice and inservice teachers (i.e., basic language constructs related to literacy) as well as perceptions of knowledge and skill, instructional philosophies, and teaching ability. It is unfortunate that research has shown that teachers lack a basic understanding of many concepts that relate directly to teaching beginning and struggling readers (e.g. Bos, Mather, Dickson, Podhajski, & Chard, 2001; Malathesa et al., 2009; Moats & Foorman, 2003; Washburn, Malathesa, & Binks, 2011). Without this knowledge, no teacher should be expected to significantly improve reading abilities, in particular among children who are at risk for reading failure. However, teacher knowledge and instructional expertise have been found in correlational and pre- and posttest studies to be related to student reading achievement (Lyon & Weiser, 2009). Also, Hornstra et al. (2010) have confirmed that when teachers hold more negative attitudes toward dyslexia, they also tend to rate achievement of students in keeping with this negative attitude.

According to Wadlington and Wadlington (2005) there are significant misperceptions and lack of awareness about dyslexia among educators. These misperceptions and lack of awareness of the early indicators of dyslexia often lead to not enough being done soon enough to diagnose and then intervene appropriately (Vail, 2001; Thorton, 1999). This can be a detriment to students and society because students that go undiagnosed and untreated have greater risk of falling through the cracks of the educational system. Dyslexia is defined differently by various segments of people which contribute to the misperceptions surrounding it and further compound the problems associated with undiagnosed dyslexia because of a lack of services and resources (Wadlington & Wadlington, 2005; Shaywitz, 2003; Rubin, 2002; Vail, 2001; Currie & Wadlington, 2000; Thorton, 1999). Dyslexia is often referred to as a hidden disability because it does not have outwardly visible signs that easily indicate to others that there is an issue, which has contributed to the problem of confusion and misperceptions (Shaywitz, 2003). In many cases dyslexia is still referred to as a defect and has a stigma that belittles a person's sense of ability and worth. The confusion around dyslexia often begins with the contradictory terminology used to describe it, assess it, and understand it (Wadlington & Wadlington, 2005; Currie & Wadlington, 2000; Kerr, 1998). Dyslexia is referred to as a specific learning disability (Knight, 1997) by some and as a reading disability (Shaywitz, 2003) by others. Shaywitz (2003) expresses concern that some continue to claim that dyslexia does not exist and they question the validity of it, despite the overwhelming research and brain imaging technology that supports the theories of dyslexia being a neurological based disorder that infiltrates every aspect of a person's life. In researching the misperceptions that exist about dyslexia, Wadlington and Wadlington (2005) identified very specific misperceptions among their study participants. Those misperceptions most highly noted in that study included the statements from their Dyslexia Belief Index: a) Word reversal as a major criterion in the identification of dyslexia, b) Individuals with dyslexia usually exhibit the same characteristics with similar degrees of severity, c) It is not true that individuals with dyslexia may pronounce words in a passage very well but be unable to comprehend it, and d) Dyslexia is not hereditary. These misperceptions were not only identified by participants in the Wadlington study but also reinforced previous studies showing that people mistakenly believe that word or letter reversal is the leading identifier for dyslexia and that comprehension is connected to pronunciation (Shaywitz, 2003; Currie &

Wadlington, 2000; Kerr, 1998). The misperceptions regarding dyslexia are consistently reinforced through studies over time and appear to not have been curtailed much through education or awareness.

The purpose of the present study, however, was to create and validate a scale measuring knowledge and beliefs regarding developmental dyslexia because insufficient or inaccurate knowledge regarding the nature of dyslexia may play a role in the over-identification or under-identification and treatment of children with dyslexia. Because the potential consequences of dyslexia knowledge for the identification and treatment of dyslexia, it is important to develop a reliable and valid method of assessing dyslexia knowledge.

2. Development of the instrument.

The steps followed for the instrument development used standard questionnaire development guidelines and methodologies (Eignor, 2001; Muñiz, Elosúa, & Hambleton, 2013; Muñiz & Hambleton, 1996). Figure 1 represents schematically the research design and procedures used in this work. A four-step procedure was followed in order to develop a measure to assess beliefs and knowledge about developmental dyslexia.



Figure 1. Summary of the research methods

2.1.- Step 1. Literature review and compilation of a pool of items.

As a first step to developing our measure, a literature scientifically-based review was realized. Based on this exhaustive literature search, the authors initially compiled a scale with 65 items to sample beliefs regarding the spectrum of knowledge about dyslexia. In order to assess for a negative response bias (i.e. attributing all negative behaviors to dyslexia) items refer to both positive and negative indicators of dyslexia. That is, the items are intended to measure respondents' knowledge of not only dyslexia is, but also, what it is not.

2.2- Step 2. Revision of items using experts' suggestions.

The second step in the development of the instrument was the revision of items using experts' suggestions. As experts we used a group of 12 university professors of learning disabilities. They read the items for content and face validity and offered comments. Based on their comments, some items were combined, and confusing items were changed or eliminated. The response options of true (V), false (F) or don't know (NS). This format allows for differentiation of what teachers do not know from what they believe incorrectly (i.e. misconceptions).

2.3- Step 3. Determination of items that comprised each of the subscales

The third step was the determination of which items comprised each of the subscales. This scale was designed to measure knowledge and misconceptions of dyslexia in three areas: general information about dyslexia, symptoms /diagnosis, and treatment of dyslexia. Final determination of which items comprised each of the subscales was made via the consensus of 12 university professors. Each participant, using a description of the scales, placed each item into one of the three subscales. An item was considered part of a subscale if at least 80% of the sample was in agreement. This process left a scale of 50 items.

2.4- Step 4. Assessment of items-quality by empirical criteria.

The fourth step addressed the pilot testing of the revised questionnaire items. The objective of this step was to assess items-quality by empirical criteria. Pilot testing included a group of 89 elementary teachers. Participants took the full 50-item scale. Based on the item-total correlations, fourteen items were deleted from the scale, resulting in the final 36-item scale. The items and their total-item correlations are shown in Appendix A. Finally, the reliability for the total scale with 36 items was found to be .76 using Cronbach's alpha. The three subscales within the scale (general information, symptoms /diagnosis, and treatment of dyslexia) all had moderate levels of internal consistency (Cronbach's alpha for the subscale of general information (17 items) was .69; for symptoms /diagnosis (32 items), was .64, and for treatment of dyslexia (9 items) was .67, in the sample of 89 elementary teachers. The coefficient alphas were somewhat lower for the individual subscales when compared to the coefficient alpha for the total scale. However, this discrepancy is likely due in part to the fewer items that compose each subscale in comparison to the entire scale.

3. Conclusions

This paper described the development of a scale measuring knowledge and beliefs regarding developmental dyslexia. Via the pilot study results, the researchers demonstrated its validity based on its content validity and psychometric properties. The scale was also practical to use. It allowed a gather a great deal of information about knowledge and beliefs about dyslexia in a brief amount of time.

In addition to direct interaction with dyslexic children, more training and greater exposure to information about dyslexia should lead to increased knowledge about the disorder. Thus, another method of assessing the validity of the scale, is to examine whether scores on the scale change as a result of educational interventions, due that greater teacher knowledge and identification of appropriate activities were related to the number of hours of professional development completed (Carreker, Malathesa, and Boulware-Gooden, 2010).

Future research, therefore, should focus on the replication of this study with a larger sample. The inclusion of personnel working would also prove enlightening. Additionally, the comparison of the knowledge and beliefs of regular teachers, special teachers, preservice teachers as well as their parents would be interesting.

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Appendix A. Scale of Knowledge and Beliefs about Developmental Dyslexia

Items	Corrected item-total correlation	Alpha if item deleted
1. Dyslexia is the result of a neurologically-based disorder.	.584	.760
2. Dyslexia is caused by visual-perception deficits, producing the reversal of letters and words.	.219	.778
3. A child can be dyslexic and gifted.	.226	.777
4. Dyslexic children often have emotional and social disabilities.	.603	.758
5. The brains of individuals with dyslexia are different from those of people without dyslexia.	.620	.761
6. Dyslexia is hereditary.	.389	.770
7. Most studies indicate that about 5% of school-age students have dyslexia.	.377	.768
8. Dyslexia has a greater occurrence in males than in females.	.418	.767
9. Children with dyslexia are more consistently impaired in phonemic awareness (i.e ability to hear and manipulate sounds in language) than any other ability.	.556	.766
10. Modeling fluent reading is often used as a teaching strategy.	.256	.775
11. People with dyslexia have below average Intelligence.	.225	.749
12. The reading of students with dyslexia is often characterized by inaccuracy and lack of fluency.	.218	.775

13. Seeing letters and words backwards is a basic characteristic of dyslexia.	.347	.794
14. Difficulty with the phonological processing of information is one of the most important deficits in dyslexia.	.229	.753
15. Intelligence tests are useful in identifying dyslexia.	.287	.777
16. All poor readers have dyslexia.	.203	.778
17. Children with dyslexia can be helped by using colored lenses/colored overlays.	.463	.783
18. Physicians can prescribe medications to help students with dyslexia.	.356	.78.0
19. Multisensory instruction is not an effective training method at the moment.	.641	.784
20. Students who have reading disabilities without an apparent cause are called dyslexic.	.197	.776
21. People with dyslexia are not stupid or lazy. Knowing about the term helps children.	.224	.781
22. Giving students with dyslexia accommodations, such as extra time on tests, shorter spelling lists, special seating, etc., is unfair to other students.	.489	.768
23. Intervention programs that emphasize the phonological aspects of language with the visual support of letters are effective for students with dyslexia.	.446	.764
24. Most teachers receive intensive training in working with dyslexic children.	.382	.768
25. I think dyslexia is a myth, a problem that does not exist.	-.565	.794
26. Repeated reading techniques are useful reading material to improve reading fluency.	.446	.764
27. Problems in establishing laterality (body schema) are the cause of dyslexia.	.193	.776
28. Students with dyslexia need structured, sequential, direct instruction in basic skills and learning strategies.	.414	.776
29. Dyslexia refers to a relatively chronic condition that is often not completely overcome.	.283	.772
30. Many students with dyslexia continue to have reading problems as adults.	.548	.761
31. Many students with dyslexia have low self-esteem.	.489	.768
32. Children with dyslexia have problems with decoding and spelling but not with listening comprehension.	.326	.827
33. Applying an individual reading test is essential to diagnosing dyslexia.	.516	.766
34. Dyslexics tend to spell words wrong.	.371	.770
35. Dyslexia usually lasts for a long time.	.553	.760
36. Dyslexia is characterized by difficulty with learning to read fluently.	.489	.768

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