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The Effectiveness of a Phonological Awareness Training Intervention on Phonological Working Memory of Children with Intellectual Disabilities

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Abstract

This study investigated the effect of using phonological awareness training intervention on phonological working memory of children with intellectual disabilities. 30 students identified with intellectual disabilities participated. The sample was randomly divided into two groups; experimental (n= 15 boys) and control (n= 15 boys). T -test was employed for data analysis. Findings from this study indicated the effectiveness of phonological awareness training intervention on phonological working memory of the target students. On the basis of the findings, the study advocated for the effectiveness of using phonological awareness training intervention on phonological working memory of children with intellectual disabilities

Keywords. phonological awareness, phonological working memory, intellectual disabilities

Introduction

Phonological Awareness

Definition of Phonological Awareness

Phonological awareness can be defined as the ability to define and manipulate the sound structure of oral language (Layton & Deeny, 2002). Phonological awareness acquisition involves the learning of two things. First, it involves learning that words can be divided into segments of sound smaller than a syllable. Second, it involves learning about individual phonemes themselves (Torgesen, 2000). The awareness of phonological structure of a word helps children to draw connections between the spoken form of a word and its written representation (Gillon, 2004).

Level of Phonological Awareness

Phonological awareness is a general ability that has multiple dimensions varying in difficulty (Smith, Simmons & Kameenui, 1998). Gillon (2004) describes phonological awareness in terms of three different levels. They are onset-rime awareness, syllable awareness and phoneme awareness.

Onset-rime Awareness

Adams (1990) describes the rime as the obligatory part of the syllable consisting of its vowel and any consonant sounds that come after it, whereas onset consists of any consonant sounds that precede the vowel. Children are considered to have awareness of onset-rime if they can analyze syllables into onset and rime units in an oddity tasks (Treiman, 1992).

Syllable Awareness

Adams (1990) defines syllable awareness as the ability to detect the smallest unit of speech that can be produced in isolation. Some linguists suggest that children develop syllable awareness before the development of other phonological skills such as on-set rime and phonemic awareness (Adam, 1990; Tingley, Dore, Parsons, Campbell & Bird 2004; Treiman, 1992).

Phonemic Awareness

Gillon (2004) defines phoneme as the smallest unit of sound that influences the meaning of a word. Adams (1990) states that the awareness of phonemes includes the abilities to segment, rearrange, and substitute them one for the other. Many researchers claim that awareness of phonemes is critical for learning an alphabetic writing system (Sawyer & Fox,

1991; Treiman, 1992; Adams, 1990; Cook & Bassetti 2005). In addition, Torgesen (2000) suggests that although phonemic decoding skills should never be considered the end goal of reading, research now shows that, for most children, these skills are a critical step along the way toward effective reading skills. Share & Stanovich (1995) point out that phoneme awareness performance is a strong predictor of long-term reading and spelling success and can predict literacy performance more accurately than variables such as intelligence, vocabulary knowledge, and socioeconomic status.

Phonological Awareness Training

According to Oktay & Aktan (2002), phonological ability is not accompanied by an innate ability, which allows children to manipulate phonological elements intentionally. In addition, Cassady and Smith (2004) suggest that children should be trained to blend bodycodas first, then to progress to more phonologically difficult blending tasks such as onsets and phonemes. Study by Cheung et al. (2001) also suggests the important role of phonological training in reading acquisition. They point out that bilingual children develop phonological awareness earlier, but in the end, monolingual children reach the same level once they receive phonological skill training in reading development. However, Durgunoglu (2002) argues that children can gain insight into phonological skills if they have had exposure in their L1.

Phonological Awareness and children with intellectual disabilities

Mental retardation is defined as an intellectual functioning level at or below 70–75 as measured by standardized IQ tests, such as the Wechsler Intelligence Scale for Children—Third Edition (WISC, Wechsler, 1991) or the Stanford Binet Intelligence Scale, Fourth Edition (Thorndike, Hagan, & Sattler, 1986), plus significant limitations in communication, self-care, home living, social, leisure, and health and safety skills; self-direction; functional academics; community involvement; and/or work (Cegelka & Prehm, 1982). Children with mental retardation typically manifest some degree of phonological deficit (Reed, 1994) that may interfere with their realization of the meaning of print (Swank & Catts, 1994).

Little information is reported on the acquisition of phonological awareness in special populations (Mourad Ali, 2013, p.13). In a recent study, Mourad Ali (2013) explored the effectiveness of a phonological awareness training intervention on pre-reading skills of mentally retarded children. A total of 47 children with mental retardation participated in this study. The sample was randomly divided into two groups; experimental (n= 24, 19 boys, 5 girls) and control (n= 23, 20 boys and 3 girls). ANCOVA and Repeated Measures Analyses were employed for data analysis. Findings from this study indicated the effectiveness of the program employed in improving pre-reading skills in the target children.

Thus the present study seeks to give answers to the following question.

Are there differences in post-test scores mean between control and experimental groups on Phonological Working Memory?

Method

Participants

Children participants selected from two schools for children with intellectual disabilities called Al Tarbya AL Fekrya schools. Participants' IQ scores were obtained by the school's administration of either the WISC (Wechsler, 1991). The sample was randomly divided into two groups; experimental (n= 15 boys) and control (n= 15 boys). The two groups were matched on age, IQ, and Phonological Working Memory Test Scores. Table

1 shows means, standard deviations, t- value, and significance level for experimental and control groups on age (by month), IQ, and Phonological Working Memory (pre-test)

Table 1. *Pretest Scores Means , standard deviations ,t- value , and significance level for experimental and control groups on age (by month) and Phonological Working Memory.*

Variables	Group	N	M	SD	t	Sig.
Age	Experimental	15	128.5	3.59	-0.29	-
	Control	15	129.0	3.74		
Phonological Working Memory	Experimental	15	6.02	4.23	-0.88	-
	Control	15	6.43	5.48		

Table 1 shows that all t- values did not reach significance level . This indicated that the two groups did not differ in age and Phonological Working Memory (pre-test) .

Measure

Children’s Test of Nonword Repetition (Developed by the researcher for this study) . It consists of 22 Nonword .Scores range from zero- 20 . Reliability coefficients were computed for the full scale . Alpha Coefficient was 0.78 .

Procedure

Participants were selected, then pretest data were collected using the pre- reading skills test. The classroom PA training program was conducted by the second author with the experimental class in one large group for 5 weeks with 20 minute sessions conducted three times a week .A variety of fun, play-based phonological activities were used with the class that incorporated the spectrum of PA skills (e.g., rhyming, sound/syllable matching, sound/syllable isolation, sound/syllable blending, sound/syllable addition or substitution, and sound/syllable segmentation).

The children participated by singing, listening, answering questions, and following directions. The following is a list of the PA activities addressed during training:

1. Sound Matching/Sound Identification
2. Rhyming Activities
3. Sound Addition or Substitution Activities
4. Sound/Syllable Blending Activities
5. Sound/Syllable Segmentation Activities.

The author started with the earlier developing PA skills, such as matching and rhyming, and moved throughout the continuum of PA skills. These activities were rotated from easiest to hardest throughout the 5 week training period. At the end of the study, the posttest data were collected again using the same measure to determine the effectiveness of the PA training.

Design and Analysis

The effects of implementing phonological awareness training intervention on phonological working memory of children with mental retardation was assessed using pre-post testing.

Results

Phonological Working Memory

Table 2. shows T. test results for the differences in post- test mean scores between experimental and control groups in phonological working memory. The table shows that (t) value 11.67. This value was significant at the level (0.01) in the favor of experimental group. The table also shows that there are differences in post- test mean scores between experimental and control groups in phonological working memory in the favor of experimental group

Table 2. *T. test results for the differences in post- test mean scores between experimental and control groups in phonological working memory*

Group	N	Mean	SD	t	Sig.
Experimental	15	13.50	1.10	11.67	0.01
Control	15	6.43	3.12		

Discussion

The main objective of the present study was to explore the effects of phonological awareness intervention on phonological working memory of children with children with intellectual disabilities.

The results of this study as revealed in table 2 show that phonological awareness intervention was effective in improving phonological working memory of children in experimental group, compared to the control group whose individuals.

The present study comes to try to resolve the conflict. Many researchers are still trying to answer the "chicken and egg" question of which came first. Is PA a prerequisite for learning to read or does PA develop as a consequence of being exposed to reading instruction (Yopp, 1992). A great majority of research conducted supports the idea of PA as a powerful predictor of early reading achievement.

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