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Determination of Phonological Awareness Skills in Educable Children with Down' Syndrom between Mental Ages of 7 To 12 in Isfahan

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ABSTRACT

Learning Phonological Awareness skills play an important role in speech and language development and also education of children. These skills enable children to express their mental concepts more completely. Past studies have shown that children with Down's syndrome have problems in learning phonological awareness skills. This study aims to determine the level of phonological awareness skills in children with Down's syndrome. In this cross-sectional research, all Isfahanian children with Down's syndrome have been examined with phonological awareness test. To examine, subjects were assessed by subtests and results were written in the checklists. Statistical analysis was done by using t-test and $SPSS_{16}$ software. Although girls did better in this research, however there was no significant difference in phonological awareness skills between two sexes. The highest average of phonological awareness skills in both sexes between 12 considered categories, were in phoneme combination skills and the lowest in middle syllable awareness skill. Phonological awareness skills from easy to difficult in both sexes were first phoneme recognition, last phoneme recognition, awareness of last syllable, rhyme, congruence, deletion of the first phoneme and deletion of the middle phoneme respectively. Based on the results of this study, girls compared to boys did better in phonological awareness skills (however the differences were not significant). Furthermore, the results showed, similar to normal kids, the subject group also did not do the same in all phonological awareness skills and the skills had not been developed to the same extent. In other words, some skills were more difficult than others and needed more time to be developed.

Keywords: Down's Syndrome, Phonological Awareness, Children, Phoneme, Educable

INTRODUCTION

Human being is a social creature that needs to exchange thoughts, express feelings and generally communicate with others. Language is the means of communication between people. The process of communication between two people consists of sending a message (expressive language) and receiving one (receptive language) (Lerner, 1997). The received message can be either in form of audio icons (speaking) or graphical-visual icons (writing) (Yew & Schmidt, 2007). In today's world, reading in an important tool to convey ideas and communicate. By reading, human being can decode written information in books, computer disks, magazines, etc. (Mostaghimzade & Soleimani, 2005).

In developed societies, it is expected that all children learn how to read. Learning how to read seems like an easy task for children, which makes people think there is no mysterious aspect to reading. Therefore, they rarely think of the complexity and learning conditions of it. However, reading is one of the high levels of language through which one decodes the icons of spoken language which have been stated in form of written language (Stage & Wagner, 1992).

Everatt believed the term phonological awareness encompasses the perception of speech sounds apart from their meanings (Everatt, 1999). In other resources, phonological awareness is referred to as a mental-verbal ability that allows people to recognize voices between words (Seki et al., 2008). And also it consists considering, manipulation and thinking about the sounds separately and in the words (Bernthal & Bankson, 2009). Phoneme awareness requires children to gain adequate representation of phonemes, as separate elements of words and syllables. It means when involved in phonological awareness tasks, children should have a developed phoneme awareness system which consists of powerful representations of their verbal phonemes. In fact, studying children's ability to manipulate the phonemes shows the depth and strength of their phonological representations (Phillips et al., 2008). It has been clearly proved that this skill (phonological awareness) is vital in literacy acquisition and development of reading and writing (Ieridou, 2006; Swan & Goswami, 1997; Boada & Pennington, 2006). This ability is so important that some children specially the poor readers might never obtain the necessary competence in complex phonological manipulating tasks (Frederickson et al., 2004).

Studies have proved that this relationship exists between Dawn's syndrome children. It also has been shown that children with Down' syndrome, according to their low phonological awareness skills, are in danger

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of having other problems in reading in future (Evans, 1994; Roch & Jarrold, 2008; Verucci et al., 2006). Down syndrome is one of the most common congenital chromosomal abnormalities which are always followed by varying degrees of mental retardation (Bittles et al., 2007). One of the consequences of this syndrome is learning and reading abnormalities. Therefore, there is urgent need of services and special attention for this group (Shin et al., 2009). Some researches on phonological awareness and reading have been conducted by Shirazi (2007), Ziatabar Ahmadi et al. (2010), Soleimani et al. (2010), Dehghan Ahmadabad & Baharluei (2005). Based on these studies, there is a significant relationship between reading skills and phonological awareness in normal children. A study by Fletcher and Buckley (2002) showed that there is a relationship between phonological awareness and reading skills in children with Down's Syndrome. These researchers examined phonological awareness and reading and spelling skills in 17 children with Down's syndrome (10 boys and 7 girls). The results demonstrated that these kids had phonological awareness and also that there is relationship between phonological awareness and reading skills (Fletcher & Buckley, 2002). Flynn and Kennedy also showed the relationship between reading difficulties and low reading skills in children with Down's syndrome (Kennedy & Flynn, 2003). Byrne studied the relationship between phonological awareness and reading skills in 22 children with Down' syndrome (aged 6.7 to 10.3). He showed in these children reading and verbal skills develop 9 months later than normal kids. It was also shown that there is a link between phonological awareness and reading skills, and also between reading and verbal skills (Byrne & Fielding-Barnsley, 1993). Based on the clinical studies, the frequency of Down's syndrome in Iran is reported one in every 814 live births (Saadat & Mahdipour, 1997). This figure is one in every 800 live births in foreign studies (Canfield et al., 2006). Therefore, according to high prevalence of this syndrome and the very important role of phonological awareness skills in learning reading and writing skills (Kay-Raining Bird et al., 2000) and also the fact that no related research has been done in this field in our country, doing research on determining phonological awareness skills seemed quite necessary, as a step toward preventing and solving reading and learning disabilities in these children. The aim of this study was to determine phonological awareness skills in educable children with Down's syndrome mentally aged 7-12.

METHODOLOGY

Our sample in this cross-sectional study included all Isfahanian educable children with Down's syndrome, mentally aged 7-12 (with an estimation of 25 people). Conditions to be picked for the study included parenteral consent and they being informed of the study procedure. Children were excluded from the study in case of severe vision, hearing problems (due to their medical records), severe motor problems in speech organs (due to clinical examinations by examiners) and refusal to participate in the project. The study sample included 24 persons (12 girls and 12 boys with educable mental age and average chronological age of 10). This study was conducted in spring of 1383, in education centers and schools of special children in Isfahan.

Researchers visited exceptional children schools in order to find samples and based on their records and speech organs examinations chose the ones with suitable conditions. They used Soleimani et al phonological awareness test (Soleimani et al., 2010). This was a visual test and consisted of 12 parts which assessed all areas of phonological awareness. Each test was given to subjects. Each valued one mark, if the answer was correct it would be written in the table. Validity and Reliability of the test had been studied and confirmed (Soleimani et al., 2010). Each section of the test consisted of 10-12 items, each item if correctly answered added 1 mark to the score of the individual. Taking this test in normal kids took 30 minutes, however in children with dawn syndrome, due to less concentration and tolerance, the test was taken sectional and discontinuous. In order to take the test, the subjects were guided how to do the test by a test help and in a quiet and convenient room. Then subtests were given to subject and each subject was evaluated individually. The examiner recorded the results of each test in the tables. As they were limitation in the focusing duration and consideration of these kids, the test was taken in several parts each at one time.

Because test items were designed based on pilot study and from easy to difficult on normal kids, if any subject could not answer 3 items in a row in each section of the test, the section would be considered to be over and the examiner would not continue to the rest of that test. Therefore the subject would not get any mark for the rest of that section of the test. Finally, all the information about each test was recorded the subject's special table. Recorded data was then entered into computer by means of $SPSS_{16}$. We used T-test in order to analyze the quantitative results of the test (phonological awareness marks). Finally, the results were reported through appropriate tables.

RESULTS

The average mark for each of the phonological awareness skills' subtests are shown in table 1. Based on this table, the lowest mean score has been in the middle syllable awareness test (0.6) and the highest in phoneme blending test (9.4). The information contained in this table has been ordered from easy to difficult based on phonological awareness skills.

The easiest phonological awareness skill was phoneme blending and the hardest is middle syllable awareness. Furthermore, skills related to identification and awareness of phoneme and syllable were more easily learned compared to deleting phonemes and syllables' skills. From all the skills assessed, the ones related to rhyme; scaling and segmentation were average in terms of difficulty (Table 1).

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When comparing phonological awareness skills between the two sexes, girls with Down's syndrome obtained higher scores rather than boys suffering from this syndrome. Also when comparing the scores of phonological awareness skills between the two sexes, in girls the lowest average was for middle syllable awareness test (0.37) and the highest average for blending phonemes test (9.37). In boys as well as the girls the lowest average score was for words middle syllable awareness test (1) and the highest was in blending phonemes test (9.44) (Table 2).

Table 1. Average score of phonological awareness skills' subtests in whole society of children with Dawn's syndrome Statistical variables

Phonological awareness skills subtests	Test's score	Average	Standard deviation
Phoneme combinations	235	9.40	1.15
First phoneme recognition	147	5.88	4.42
First syllable awareness	141	5.64	4.57
Last syllable awareness	135	5.40	4.29
First phoneme recognition	135	5.40	3.70
Rhyme	126	5.04	3.96
Congruence	112	4.48	3.59
Fractionated phoneme	96	3.84	3.23
Last phoneme elimination	78	3.12	3.24
Middle phoneme elimination	40	1.60	2.32
First phoneme elimination	35	1.40	2.12
Middle syllable awareness	15	0.60	2.12

Table 2. Average score of each phonological awareness skills subtest in children with Dawn's syndrome regarding gender Statistical variables

Phonological awareness skills subtests	Female	Male	Female	Male
Phoneme combinations	150	85	9.37	9.44
First phoneme recognition	104	43	6.50	4.77
First syllable awareness	101	40	6.31	4.44
Last syllable awareness	99	36	6.18	4.00
Last phoneme recognition	89	46	5.56	5.11
Rhyme	86	40	5.37	4.44
Congruence	83	29	5.18	3.22
Fractionated phoneme	73	23	4.56	2.55
Last phoneme elimination	59	19	3.68	2.11
Middle phoneme elimination	29	11	1.81	1.22
First phoneme elimination	19	16	1.18	1.77
middle syllable awareness	6	9	0.37	1.00

DISCUSSION

The present study was conducted regarding determination of Phonological Awareness skills in educable children with Down's syndrome between mental ages of 7 to 12 in Isfahan. According to the goals, questions, research hypotheses, results and considering the fact that no similar study has been conducted on these children in Ian, the results were only compared to researches that had been carried out in other countries and were analyzed based on that. Based on demonstrated in Table 2, in both sexes the highest score was in blending phoneme skill and the lowest in middle syllable awareness skill. It shows that middle syllable awareness skill in the hardest phonological awareness skill between all 12 skills that were tested. Previous studies have shown that one of the reasons of the decline in reading ability could be weakness in phonological awareness skills (Dehghan Ahmadabad & Baharloei, 2005).

Buckley and Fletcher in a research on 17 kids with Down's syndrome demonstrated that phonological awareness skills are related to subjects' ability to read (Fletcher & Buckley, 2002). They studied phonological awareness ability as a whole and did not divide it into 12 skills. Therefore, we can not exactly compare this study with Buckley and Fletcher's study, however it could be claimed that the results of this study are compatible with their results. Moreover, Kennedy and Flynn (2003) in a research on Down's syndrome children claimed that the kids weakness in reading skills is because of their poor phonological awareness skills. Therefore, they claimed the best way of assessment and intervention in improving reading skills in these kids is therapeutically interventions in their phonological awareness skills (Kennedy & Flynn, 2003). This result is compatible with the results of present study which emphasizes on low phonological awareness skills in these children. However, the results of present study have been carefully categorized and phonological awareness skills have been studied. It also mentions that the hardest phonological awareness skill that influences on reading ability seems to be awareness of middle syllable skill. To emphasize on this skill and exercise it could help in development of reading ability in children. According to results of this study, in order to work on phonological awareness skills and as a result improving reading skills in children, considering easy to difficult trend of skills, we could manage learning process of phonological awareness skills in an easy to difficult

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manner. In this way we could help the trend of improving reading skills in these children. The strength of the results of this study is determination of easy to difficult trend of teaching and treating phonological awareness skills in these children which is very helpful and effective.

The results of a study conducted by Ziatabar Ahmadi et al. (2010) on differences between the two sexes in their score in phonological awareness skills have been consistent with the results of this research and although girls have had higher scores compared to boys it is has been emphasized that the difference has not been significant. These results are also in line with the study conducted by Byrne & Fielding-Barnsley (1993) and Kay-Raining Birs et al. (2000).

Considering the fact why phonological awareness score in middle syllable of the words has been achieved less, it could be said that as children have no information before the first syllable of the word, they are 100% concentrated on the first syllable, as a result first syllable's score is higher. About the fact that the last syllable gained higher score compared to middle syllable, it could be said that perhaps because after the last syllable of the word there is no other stimulus, the child processes that more carefully. Lastly, middle syllable's score which has been less than first and last syllable which we discussed, could suggest that because middle syllable is located after and before the other two syllables, so the child's concentration and attention is less during processing that, which causes a lower score in middle syllable.

CONCLUSION

According to the results of the present study it could be claimed that phonological awareness skill in middle syllables has been much more difficult. Therefore to facilitate teaching and treating children's reading skill following easy to difficult trend which was discussed in this study could be helpful. And it could help the development of reading skill in these children.

Suggestions

It is suggested to increase the number of samples in future studies to conduct more reliable results. Furthermore, perhaps doing research at other levels of mental activity could offer new data.

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