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Involvement of Social and Cognitive Factors in Reading Skills of Boys and Girls: A Comparative Study

^a Ammara Farukh, ^b Masroor Sibtain, ^c Hafiz Muhammad Qasim, ^d Asma Kashif Shahzad

^a Assistant Professor, Department of English, University of Education, Lahore, Vehari Campus

Email: ammara.farukh@ue.edu.pk

^b Assistant Professor of English, Govt. College of Science, Multan, Email: masroorsibtain@gmail.com

^c Assistant Professor, Department of Applied Linguistics, GC University, Faisalabad

Email: muhhammadqasim@gcuf.edu.pk

^d Assistant Professor, COMSATS University Islamabad, Vehari Campus, Email: asmashahzad@cuivehari.edu.pk

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ABSTRACT

It has been a controversial issue to ascertain whether girls have an advantage in literacy skills over boys or not. There are studies showing a minor or no lead of girls in literacy skills (White, 2007). On the other hand, several studies described better literacy skills in girls than boys (Ready, LoGerfo, Burkam & Lee, 2005; Coley, 2001). Reasons like differences in biology, cognitive and physical maturation (Leinhardt, Seewald & Engel, 1979) are given to explain these differences. In this study, 8-9 years 66 grade 3 children were tested on loud reading tasks in both Urdu and English. The children were extracted from a bigger sample which participated in a previous study. In the present study, we used 3-word lists (words of mixed difficulty, pseudo-words, and easy frequent words) in both Urdu and English (3+3). A t-test was run to see the difference of performance on all word reading tasks by girls, and boys. The girls scored higher than boys on all Urdu and English tasks, except pseudo-words in Urdu where the difference was not significant whereas a tendency towards significance could be seen. The results presented evidence in favour of the advantage (cognitive or social) of girls over boys of the same age and grade.

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Corresponding author's email address: ammara.farukh@ue.edu.pk

1. Introduction

It has been a controversial issue to determine the role of differences in gender in the literacy skills of older and young children. For, a large number of children observed no gender differences in the early grades (Entwisle, Alexander & Olson, 1997; Davies & Brember, 1999). These observations were also confirmed even for secondary level (Waber, 1979). In these studies, girls showed either no lead or a minor advantage in literacy skills (e.g. Below, Skinner, Fearing, & Sorrell, 2010). On the other hand, several studies e.g. Coley (2001), Gambell and Hunter (1999), Phillips, Norris, Osmond and

Maynard (2002), Ready, LoGerfo, Burkam and Lee, (2005) described better literacy skills in girls than boys. To investigate the idea that girls come to schools with better literacy skills than boys, Below, Skinner, Fearing and Sorrell (2010) used repeated measures analyses of multiple preliteracy skills across 5 grades (1 -5). They observed that the girls score higher than the boys on four pre-literacy skills, but the differences were not significant. They did not find any significant gender difference on the selected literacy tasks until in the fourth-grade sample where the female students were observed to benefit significantly. Again, in the 5th-grade sample, these differences were insignificant. In grade 5 sample boys presented greater upturns in oral reading fluency, and when the academic year ended, oral reading fluency scores of both boys and girls were almost similar.

Similarly, seven graders (Gates, 1961) were investigated and it was observed that the female students were better on 18 from 21 comparisons of reading measures. Great differences were reported in comprehension, speed and vocabulary skills. In another study (Chatterji, 2006), it was also observed that male-students scored below than that of the female ones on different tests i.e. beginning and ending sounds, letter recognition, listening comprehension, print familiarity, receptive vocabulary, rhyming sounds, word recognition, and word comprehension in the context. The difference was observed to increase as the literacy training of a year was over until the end of grade 1. Explanations like differences in biology, cognitive and physical development (Leinhardt, Seewald, & Engel, 1979) have been presented to support the observed better performance of girls on literacy tasks. The difference of learning approaches (Ready, LoGerfo, Burkam, & Lee, 2005) to the dissimilar cultural expectations reserved for males and females are also considered as important factors for the observed difference (Sommers, 2001).

Ayers (1909) also showed concern over a deficit in males in reading success. The results were confirmed later by different researchers with different populations, and measures, across different age/grade ranges. It was also emphasized that physiological developmental and cultural or societal aspects might affect the deficits of male students in reading skills (see Alloway & Gilbert, 1997; Holbrook, 1988). Researchers of physiological-maturational theories like Das, Kirby and Jarman (1979), Geschwind and Behan (1982), Mills (2003), Naour (2001), Waber (1979) and Witelson (1976) investigated the processing variances. Sequential-processing was referred to as the ability to process information in the sequence. Similarly, synchronized-processing was described as the ability to unite different parts of the information to form meaningful products. Studies by Geschwind and Behan (1982), and Waber (1979) reported the presence of bigger levels delay in the fetal-testosterone maturation process of the left-brain hemisphere, causing the boys to lag behind in the activities which involve left hemisphere like sequential processing. Therefore, the male students are most likely to perform better on synchronized-processing tasks (i.e. visual) and inferior on sequential-processing tasks (i.e. auditory) (Mills, 2003; Witelson, 1976).

Although both of these types of processing (i.e. auditory and visual), in the view of Das, Kirby and Jarman (1979), Naour (2001) and Witelson (1976) are related to development of reading skill yet, the problems related with the sequential-processing may directly be related to early literacy skill development. Another factor discussed is environmental factors. It has been suggested that the gender differences affecting the reading skills are caused due to the cultural, environmental, or societal factors. In this context, a theory has also been presented i.e. differential response theory. It embarked on the notion that the behaviour of a teacher toward his/her students is subjective to the students' behaviour and his/her (teacher's) perception about what those learners are expected to do. It entails, as perceived by Bank, Biddle and Good (1980) that the teacher may hold greater expectations for the female students that turn into self-fulfilling predictions. A study (Maccoby, 1990) found evidence for this assumption by

recording the teacher's interactions with the students of grade-2 in mathematics and reading lessons. It was observed that the teachers spent more instructional-time as well as interact more with the female students in reading lessons. On the other hand, the teachers spent more instructional-time and interacted more with male students in math lessons. Although the differences in achievement were small initially in reading and math, yet the differences favouring females in reading achievement scores were evident in the end of the year.

Large-scale reading assessments, constantly observed that girls, overall, exceed boys in reading abilities e.g. studies from 8 to 16 years boys and girls sustained reporting this gender difference at both national and international levels (CMEC, 1999; Elley, 1992; EQAO, 2003; NAEP, 2005; Naour, 2001). Yet, contrary to all such findings, a study by Witelson (1976), suggested that there are no practical consequences of this difference and that the idea of boys' under-achievement has been exaggerated. The data for this study were taken from the reading component of Ontario Secondary School Literacy Test (i.e. N=113050). The gender effects could explain no effect of gender in reading achievement. In this study, 8-9 years grade 3 children, with varied reading abilities (both typical, and poor readers) were tested on loud reading tasks in both Urdu and English. We used 3-word lists (words of mixed difficulty, pseudo-words, and easy frequent words) in both Urdu and English. Each list consisted of 10 items. The objective of this research was to explore if there lay any effect of gender on the performance of the participants on the said reading tasks.

2. Participants and Procedure of the Study

For this study, 66 school children chosen as the participants from a sample of 150 grade-3 children (54 girls and 96 boys) from a previous study by Farukh & Vulchanova (2014). The participants were studying at both public and private sector schools of a developing district in the Punjab, Pakistan. They were previously evaluated for reading skills on a classical RAN battery and a non-word repetition task (Denckla & Rudel, 1976) after the addition of a RAN task designed in Urdu (Farukh & Vulchanova, 2014). Scores for the rapid automatised naming of colours, letters, objects, numbers, and reading speed, and errors in the repetition process of four-syllable non-words, facilitated the further distribution of the students into different groups i.e. a) Control group and b) Reading Deficit (RD) group. The former comprised of the students scoring between the 25th and 75th percentile whereas, the later comprised of the students scoring below the 25th percentile on three or more tasks. Hence, avoiding the inclusion of the top performers, the study considered the control group children from Urdu public and English Private schools (N=32), and children with a reading deficit, RD Group from the same schools (N=34).

2.1 Testing procedure

To ensure that the groups did not differ on non-verbal intelligence, and to rule out the possibility of any cognitive deficit, prior to the actual testing, the participants were tested on the selected standard non-verbal IQ tasks adapted and performed in Urdu.

2.2 Word Reading Tasks and Scoring

The children were retested on a battery of tasks designed for the study, including three lists of words (in English and in Urdu). The 1st list included words of mixed difficulty, the 2nd list included pseudo-words, and the 3rd list included easy frequent words. Each list included 10 words to read aloud. 1 point was given for each correct response meaning that for each list of 10 words the maximum score was 10.

3. Results

A t-test was run to see the difference of performance on all word reading tasks by girls, and boys. The girls scored higher than boys on all Urdu and English tasks. The results were as follows: for

mixed words English, ; t-value =2.48, df = 64, p < .001; for pseudo-words English; t-value =2.66, df = 64, p < .001; and for easy frequent words English, ; t-value =3.12, df = 64, p < .001. The between-subject effects for reading lists in Urdu were as follows: for mixed words Urdu, ; t-value = 2.71, df =64, p =.002; for pseudo-words Urdu, ; t-value = 1.75, df= 64, p = .02; and for easy frequent words Urdu, ; t-value =2.35, df = 64, p < .001. A descriptive statistics table is given in appendix A. to explain the scores. Bonferroni correction method, for 6 independent comparisons, was applied and, the significance level was set as .008. There seems to exist a significant difference in the word reading scores of the male and female participants on all word lists (both in English and Urdu) except on pseudo-words in Urdu where the difference is not significant, whereas we can observe a trend towards significance.

4. Discussion

The results of the study show a significant difference in loud word reading scores in both English and Urdu. These results(see also Appendix. 1) support the claim of the studies,performed on an international scale,by Coley (2001), Gambell and Hunter (1999), Phillips et al., (2002) and Ready et al. (2005) that girls are better in literacy skills than boys.They enjoy an advantage over the boys in being literate. Biological differences in cognitive development and physical maturationare considered responsible for such differences(Leinhardt et al.,1979). The girls are also thought to adopt different learning approaches (Ready et al.,2005) to meet with the dissimilar cultural expectations reserved for males and females (Sommers, 2001). Although there is a small number of studies that do not conform to such results (Entwisle, Alexander & Olson, 1997; Davies & Brember, 1999; White, 2007), such studies report a minor or no difference between the literacy outcomes of boys versus girls.

If we have a look at the studies that presented a significant difference in literacy perception and academic achievements, we find literature assigning the feminized educational practices as well as structures being responsible for it (Sommers, 2001). Some of the strategies have also been suggested for classroom use to mediate this gender gap i.e. a) the use of materialswhich are more boy-friendly, b) introduction to more male teachers and male role-models, c) adoption of technology-based educational programmes, and d) experimentation with single-gender schooling (Alloway & Gilbert, 1997; Gurian, Henley & Trueman, 2001; Mills, 2003; Noble & Bradford, 2000). All of this literature suggests changed teaching and professional practices. Most of the educational systems on the international level are supposed to suit more to girls than boys (Mills, 2003). Therefore, some practical steps might be taken to adapt the curricula taking biological, cognitive, psychological, and social differences between boys and girls.

The present study presented girls advantage in loud word reading over boys but, the reason for this difference still needs to be investigated to reach the factors thateither this is the curriculum or social and cognitive factors which are responsible for the difference in this particular age group. The sample of the present study is too small to be decisive about the suitability of curriculum of the Pakistani education system. There might be a study conducted on a large scale to support the idea if the difference observed really exists or not. There is also another limitation of the study that it did not control the participants for their cognitive abilities. Any future study should take the cognitive ability measures into account. The study could include other literacy skills like text reading, writing, etc. in both Urdu and English.

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Appendix

Appendix 1. Group Statistics

	Gender	N	Mean	Std. Deviation	Std. Error Mean
MixedwordsEng	girls	22	6.18	1.71	.364
	boys	44	4.41	3.12	.470
Pseudo-wordsEng	girls	22	7.23	1.57	.335
	boys	44	5.20	3.38	.510
EasyFrequentEng	girls	22	9.32	.95	.202
	boys	44	6.93	3.51	.530
Mixedwordsurdu	girls	22	8.55	2.20	.469
	boys	44	6.27	3.60	.542
Pseudo-wordsUrdu	girls	22	7.32	2.38	.507
	boys	44	5.89	3.43	.517
EasywordsUrdu	girls	22	8.95	1.84	.392
	boys	44	7.00	3.66	.552