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RESEARCH ARTICLE

SOCIO-COGNITIVE FACTORS AND SPELLING DIFFICULTIES IN ELEMENTARY SCHOOL CHILDREN

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ABSTRACT

The present study aimed at examining some of the socio-cognitive factors which have a correlation with spelling difficulties in elementary school children. Purposive sampling was used to select a sample of 28 students who belonged to second, third and fourth grades. An explorative research design was used in this study. Children were assessed on phonics, phonological awareness, visual and auditory discrimination and spelling. Information regarding the children's self-esteem and whether they had Attention Deficit Hyperactivity Disorder was obtained from the teachers at school. A socio-demographic sheet was given to the parents to study the number of languages spoken at home, the history of learning problems in the family, the age, education and occupation of parents. Correlation showed a statistically significant association between the grade of the child, and the age of both parents with spelling difficulties in the children.

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INTRODUCTION

The Diagnostic and Statistical Manual of Mental Disorders V (DSM V) (APA 2013),proclaims that the skills of children with learning disabilities are much below those expected for their age as indicated by a standardized test. Children with Learning Disabilities are not dull or lazy, it is just that they receive and process information in a different way as their brains are wired differently. (Kemp, Smith & Segal 2015)

Lawrence (1996), in an article spoke about how people's achievement is dependent on how they feet about themselves. Attention span refers to the ability to sustain one's attention for long enough to learn a task .Findley in a 2005 article told the story of her twin daughter Heather who was born with cerebral palsy. Heather had a short attention span while she worked at her therapy sessions, yet she would spend hours working at painful and difficult tasks that she set for herself. This indicates that children can sustain their attention to tasks that interest them and those that they value. Sustained attention refers to the ability to concentrate on a task for a required length of time. It is more difficult to sustain attention while working on more difficult tasks. A study by Rangan, Nagendra and Ramachandra in 2009 examined the effect of the Modern Educational System (MES) and the Gurukula Educational System (GES) on sustained attention in boys over one academic year. 49 boys between 11-13 years were matched on age, socioeconomic status and family background. The Six Letter Cancellation Test was used to assess the children's sustained attention. The GES used asanas, meditation, recitation of mantras, pranayama, yogic prayers, yogic games (which were games that combined stimulation and calming of the mind) and worship. The MES used physical exercises, music, mathematical puzzles, prayer and sports. The results showed a significant improvement in sustained attention scores over the academic year for the GES group but no significant improvement for the MES group. The curriculum of the GES group was found to improve the functioning of the right fronto-parietal cortex that plays a role in sustained attention. The daily chanting of vedic mantras and the reduction in the anxiety due to practicing yoga may have improved performance on tasks requiring sustained attention.

According to Brinckerhoff, Shaw & McGuire in 1993, the difference between students with learning disabilities and slow learnersis that slow learners perform poorly in all academic areas whereas children with learning disabilities do quite well in certain areas but poorly in other areas (Wadlington, Shirley & Sandra 1996).According to different studies the important skills required in spelling are phoneme awareness, which is the understanding of and the ability to manipulate speech sounds. It also refers to the ability to make a connection between a written letter and its corresponding sound (Caravolas *et. al.*

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2001). It is also important to have knowledge of morphemes (smallest component of language that conveys meaning), orthographic patterns (sequences of letter) and mental graphemic representations of words (Kelman and Apel 2004).

Gettinger and Koscik in 2001 stated that children with learning disabilities may also have behaviour difficulties or difficulties in their social skills. Hughes and Baker (1990) indicated that children who have experienced rejection, humiliation, and failure generally have feelings of low self-worth and vulnerability. Porter and Rourke (1985) found that 50% of their sample did not have problems in their social and emotional functioning. (Riddick, 1996). This indicates that all children with learning problems do not necessarily have difficulties with their social skills.

Seligman talked about the concept of learned helplessness. He explained this phenomenon by saying that individuals who had been put into a negative situation over which they feet they did not have control and could not escape, feet demoralised and apathetic. Even when these individuals were put into positive situations, they continued to be apathetic and displayed learned helplessness (Riddick, 1996, p. 37). In 1974, Callison gave 8 year old children half the Piers Haris Self-Concept scale to complete, then they were stopped and given a math test, half of them were told that they had done badly whereas the other half were told that they had done well. The children were then allowed to complete the rest of the self-concept scale. Children who had been given negative feedback obtained lower scores on the second part of the self-concept test, indicating that children's self-concept is influenced by feedback (Riddick, 1996). A positive self-esteem predicts success at school. Another important factor in learning is emotions. Bryan (1995) found that when children experienced positive emotions, they were more likely to perform better on tasks such as learning new vocabulary or math and negative emotions made them perform poorly on these tasks (Riddick 1996, p 47).

Gentry (1985), a distinguished researcher in the field of spelling development through his research has demonstrated that, children's writing moves through different stages. Initially, children develop pre-phonetic writing; in this stage, the association between letters and sounds does not exist. Children emulate writing and draw and unsystematically sequence letters or shapes together. In Stage 2, children convey meaning by using "invented spellings." In Stage 3, children begin to spell more accurately and to follow a few of the syntactic rules of language. This is the phonetic stage. In Stage 4, spellers are able to form an image in their minds of how words are spelt (Stringer, Rhonda and Mary, 1999). A study by Manning and Clark in 2005,indicated that there isn't a right level of spelling for children at a given age. Children who live in homes in which the people around them are better educated and those who attend pre-school environments which encourage a high level of education tend to be at higher spelling levels, due to the richer educational experiences that they have had. (Jamtsho 2015).

A 1991 study by Oliver and Nancy looked at familial factors and developmental factors as possible contributors to learning disabilities. The sample size in this study was 272 students, they were divided into a learning disabled group and a control group. Learning problems in genetically related relatives was gauged by gaining information from the mother. The developmental factors assessed in this study were term of pregnancy, birth order, twin status and type, gender, birth complications and handedness. The children with learning disabilities were more likely to be enrolled in lower grades and they were less likely to be only children. Families of children with learning disabilities had a greater tendency to have more offspring, both biological and step children, the mothers and fathers were less well educated, the fathers were more likely to work part time and the mothers were more likely to have a lower professional status. A questionnaire was used to collect information about the living arrangement of the child, family members and developmental factors such as age and gender of the child, order of birth, number of brothers and sisters and learning disabilities. The third part got information about the child's parents, their education, employment, household composition and their social status. The study indicated that familial learning problems predict to a great extent learning problems in offspring. An article by Anderson in 2000, emphasized the importance of parental involvement in children's education from Kindergarten to 12th Grade. A parent who is completely involved in a child's learning and provides learning resources at home has a significant impact on academic success and cognitive growth. Criscuolo in 1984 talked about two kinds of parental involvement. One is surface involvement, in which the parent monitored the child but this was not as effective as meaningful involvement in which the parent worked directly with the child under the supervision of the teacher (Anderson 2000). A correlational study done by Neuman (cited by France and Meeks 1986), indicated that one of the positive predictors of academic success was the educational level of the parents. Anderson conducted a study in order to come to a conclusion whether parental intervention would bring about a difference in reading success. The sample consisted of 30, 2nd Graders who attended a remedial reading program. The children were first assessed on reading vocabulary and comprehension. A questionnaire was used to find out the importance that parents attached to reading. It was found that families can provide a rich learning environment for children.

A study by Otaiba, Puranik, Rouby *et al.* in 2010, found that literacy of the family, education levels of parents, and demographic factors along with conventional literacy skills accounted for 66% of the variance in spelling scores when compared at the beginning and at the end of kindergarten in foreseeing achievement in spelling in children at the end of the kindergarten year. According to Gardner, today's education system revolves around the linguistic method of teaching but by presenting material in a variety of ways, learning would be better. He spoke about 7 different intelligences, they are, musical, interpersonal, intrapersonal, visual-spatial, body-kinaesthetic, linguistic and logical-mathematical intelligences. A study was done by Biedinger in 2011 to study the effects of the environment of the home and the educational levels of the parents on the cognitive skills of 3-5 year old German children. The families were interviewed twice about 12 months apart. The Kaufman Assessment Battery for Children, a standardized developmental test was administered to the children to test their

cognitive abilities. The cognitive abilities that the children were assessed on were: (i) magic window: which required the children to identify a picture through a slit; (ii) face recognition: in this activity, the children had to identify the picture of an individual person which was previously shown to them, out of a group of people; (iii) gestalt closure: this activity required the children to identify a picture after examining an incomplete inkblot drawing. The number of years of education of the parent, who was primarily responsible for the child was recorded. Information regarding the parent's (i) telling his/her child stories; (ii) reading to the child;(iii) playing board games or cards with his/her child, was recorded on a 7 point likert scale ranging from 1 which corresponded to 'never' and 7 which corresponded to 'daily.' The results of the study indicated that the cognitive outcomes of the child increased as the education of the parents increased. The Cognitive skills of a child were also greatly influenced by his/her home environment.

Children's spellings are analysed in order to gauge children's understanding of the letter sounds and to guide specific instruction to meet the children's needs. Regular assessments of learning are important to understand the extent of learning and whether there is need for repetition. The present study looked at whether there was a correlation between some socio-cognitive factors and spelling difficulty in children.

MATERIALS AND METHODS

This study was an explorative study conducted to examine whether there was a relationship between some Socio-cognitive factors and a child's performance on spelling. The hypotheses of the study were:

1. There is a relationship between grade of the child and his scores on spelling
2. There is a relationship between gender of the child and his scores on spelling
3. There is a relationship between parents' education and a child's scores on spelling
4. There is a relationship between parents' occupation and a child's scores on spelling
5. There is a relationship between family history of learning problems and a child's scores on spelling
6. There is a relationship between number of languages spoken at home and a child's scores on spelling.
7. There is a relationship between the awareness of phonemes and a child's scores on spelling.
8. There is a relationship between phonological awareness and a child's scores on spelling.
9. There is a relationship between inattention and a child's scores on spelling.
10. There is a relationship between self-esteem and a child's scores on spelling.

Sample: Purposive sampling was used to choose 28 students from 2nd, 3rd and 4th grades. Children who had average or above average IQs and had similar scores on the ADHD Rating scale but did not have full blown ADHD were chosen.

Measures used in the study

The Knox Cube Imitation Test was used to determine intelligence. The performance on this test is linked to both Verbal IQ and Performance IQ. It was developed in 1913 by Howard Andrew Knox. The reliability coefficient of this test was found to be 0.99 for sustained attention and concentration (Vazir, Nagalla *et al*. 2005).

A Socio-demographic sheet was used to record details about the child and his/her family such as age, education and occupation of the parents, number of languages spoken at home and family history of learning problems.

The children's ability to identify the letters by their sounds was assessed using the Grapheme-Phoneme Correspondence Test.

The Vernon's Graded Spelling Test (2nd edition, 1998) was used. This test has 80 words and measures a student's ability to correctly spell out words that are orally presented. An analysis of the initial edition of this test obtained a split half reliability of 0.94 from samples of Grade 4 and 7 (Levy and Goldstein 1984).

The Phonological Awareness Assessment [PAA]: Auditory Discrimination test, which tests a child's ability to discriminate auditorily between the same/ similar pairs of words was used in this study.

The Daniels and Diack Test of Visual Discrimination, was used to assess whether a child had difficulty with visual discrimination which would contribute to spelling difficulty.

The ADHD Rating Scale, was used to assess children on the aspects of inattention, hyperactivity and impulsivity. It was developed in 2008 by The Foundation for Medical Practice Education.

The Elision section of the Comprehensive Test of Phonological Processing was used. It measures the ability to remove phonological portions from spoken words and then say them. The Test Re-test reliability was .88 (for 5-7 year olds) and .79 (for 8-17 year olds). (Wagner, Torgesen *et al*. 1999)

A Self-esteem checklist, was developed to be used in this study. The teachers scored it keeping the concerned child in mind. It was developed using the Rosenberg and the Coopersmith Self-esteem inventories.

Statistical analysis

Correlation was conducted to analyse whether a relationship existed between any of the socio-cognitive factors and the children's performance on spelling.

RESULTS

This study examined whether there was a correlation between some socio-cognitive factors and children's scores on spelling. Even though genes were seen as an important factor that would contribute to learning disabilities in children, today home

environment is seen as an equally important contributor. It was believed that if both parents worked full time, the child's marks at school and his general academic performance would fall.

The Table shows the correlation between the socio-cognitive factors and the scores on spelling for the group of children.

Variables		Spelling
Grapheme Phoneme Correspondence-Sounds	Pearson Correlation	-0.166
	Sig. (2-tailed)	0.399
Elision	Pearson Correlation	0.09
	Sig. (2-tailed)	0.648
Auditory Discrimination-Words	Pearson Correlation	-0.159
	Sig. (2-tailed)	0.418
Auditory Discrimination-Non-Words	Pearson Correlation	0.073
	Sig. (2 tailed)	0.71
Visual Discrimination- Letters	Pearson Correlation	-0.02
	Sig. (2-tailed)	0.919
Visual Discrimination-Shapes	Pearson Correlation	0.026
	Sig. (2-tailed)	0.896
Self-Esteem	Pearson Correlation	-0.253
	Sig. (2-tailed)	.194
Inattention	Pearson Correlation	.321
	Sig (2-tailed)	0.096
Impulsivity& Hyperactivity	Pearson Correlation	0.209
	Sig (2 tailed)	0.287
Gender	Pearson Correlation	-0.056
	Sig (2 tailed)	0.777
Grade	Pearson Correlation	.540**
	Sig (2 tailed)	0.003
Lang spoken	Pearson Correlation	-0.027
	Sig (2 tailed)	0.893
Mothers' Age	Pearson Correlation	.468*
	Sig (2 tailed)	0.012
Mothers' Education	Pearson Correlation	0.291
	Sig (2 tailed)	0.132
Fathers' Age	Pearson Correlation	.414*
	Sig. (2-tailed)	.029
Fathers' Education	Pearson Correlation	0.137
	Sig (2 tailed)	0.487
Mothers' Occupation	Pearson Correlation	-0.088
	Sig (2 tailed)	0.656
Fathers' Occupation	Pearson Correlation	-0.025
	Sig (2 tailed)	0.899
Family Hist of Learning Problems	Pearson Correlation	0.063
	Sig (2 tailed)	0.752

A moderately positive correlation of .540 existed between the Grade of the child and Spelling difficulty which is significant at q< .01. The reason for a positive correlation between a child's Grades and his/her scores on spelling may indicate that as a child goes into higher grades, even though spellings get more difficult, a child who is taught from the beginning of formal education how difficult words are to be dealt with learns techniques to remember them. For instance, a child may syllabicate words, he/she may follow the look-cover-write-check method until he learns to spell new words, he/she may pay close attention to the irregular parts of words, which allow them to stick firmly in his/her mind. Using new words in sentences may make the child understand a word within a context enabling better retention of the word. Contradictory to these findings, a study conducted by Berninger *et al.* in 2000, indicated that spelling mistakes are often ignored in the lower grades and this continues until the child is expected to give up many written assignments in the higher grades and this is when children are pulled up for making spelling mistakes. This increasing difficulty with spelling could have been helped more efficiently if the children's spellings were corrected in the lower grades.

A moderately positive correlation of .468 was seen between Mothers' Age and Spelling difficulty in the child, which is significant at p < .05. A moderately positive correlation of .414 is also seen between Fathers' Age and Spelling difficulty in the child which is significant at p < .05. Research has shown that the proportion of children with psychiatric or neurological disorders is higher when their parents are older as opposed to children who have parents of average age (Lewis J 2013).

A study by Oliver and Nancy in 1990 found that children with learning difficulties were more likely to have parents who had lower levels of education and lower occupational status, but in this study a statistically noteworthy correlation was not found between the education of parents, their occupational status and children's scores on spelling. The study by Oliver and Nancy (1991) found that demographic factors, familial learning problems and gender quite significantly predict learning problems in children. In the present study, a family history of learning problems was not seen to have a statistically significant correlation with spelling scores. Though no statistically significant correlation was found between spelling difficulty and gender a study by Rios in 2000 found that girls from grades one through six on an average perform better in spelling than boys (Boras 2003).

A very weak negative relationship of -.020 (p .919), existed between Visual Discrimination of Letters and Spelling scores. A very weak negative correlation of -.159 (p .418) existed between Auditory Discrimination of Words (AD-W) and Spelling scores. This indicates that as the visual and auditory discrimination difficulties in a child decreases, the child will be better able to spell out words as he will be able to distinguish between printed letters and the sounds that the different letters make. A very weak negative relationship of -.088 (p.656) existed between Mothers' Occupation and Spelling scores. The present study did not find a significant correlation between mother's full time or part time work and spelling difficulties in children.

A review of 69 studies conducted between 1960 and 2010, found in the Psychological Bulletin indicated that kids whose mothers went back to work before they turned three did not have more behavioural or academic problems than kids with stay at home mothers. In fact some studies found that these children performed better than children of stay at home mothers. These findings go against the stereotype of the negative effects that working mothers will have on their children later in the children's lives (cited in Luscombe 2010).
A weak negative correlation of -.253 (p .194) also existed between Self-Esteem and Spelling scores. Even though there may be a correlation between self-esteem and academic performance, research hasn't been able to prove a causal relationship between the two factors. Morris Rosenberg and colleagues in 1989 said that global self-esteem had little or nothing to do with enhancing academic performance. A very weak negative correlation indicates that as one factor increases the other one will decrease but this will not happen proportionately.

A very weak positive correlation of .090 (p .648) existed between Elision and Spelling scores. When children do better

on phonological awareness tasks such as elision, in which they must delete sounds or parts of words and then say the word, they also get better scores on spellings. Family History of Learning Problems also shared a very weak positive correlation of .063 (p .752) with Spelling scores.

This finding indicates that if learning problems have existed for generations in a family, the likelihood of learning difficulties in children would increase. A weak positive correlation of .291 (p.132) existed between Mothers' Education and Spelling scores. A weak positive correlation of .137 (p .029) also existed between Fathers' Education and Spelling. The above scores indicate in this study a statistically significant correlation between parents' education and spelling scores in children was not found. A weak positive correlation of .209 (p .287) existed between Hyperactivity/ Impulsivity and Spelling scores. A very weak positive correlation indicates that as one variable increases the other one will increase too, but disproportionately. A moderate positive correlation of .321 (p.096) existed between Inattention and Spelling scores.

A correlation between elision, visual and auditory discrimination and inattention with scores on spelling was expected to exist prior to the start of the study as these skills are directly related with spelling. Visual discrimination helps children to differentiate between letters that resemble each other.

For instance pairs of letters such as b/d, p/q, f/t etc. resemble each other closely and children get confused between them in the early years of school but this factor did not have a significant correlation with spelling in this study. The other factor which was expected to have a correlation with scores on spelling was inattention but this study reiterates the fact that even though children may not seem to be listening to the teacher, very often are paying attention to her/him.

CONCLUSION

Therefore the hypothesis in the study which states that, 'There will be a correlation between some Socio-cognitive factors and children's scores on spelling', is accepted for child's grade, age of the mother and age of the father, but rejected for gender of the child, parents' education and occupation, family history of learning problems, number of languages spoken at home, elision, visual and auditory discrimination.

An important finding from the Review of Literature in this study is that not all children with learning problems will automatically have social and emotional problems too. Another finding from a collection of studies in the Review of Literature section points out that children whose mothers go to work before they turn three perform better at school that children of stay at home mothers. An enriching home environment does a great deal in helping a child in his academic achievement.

This study also indicated that as today's parents are older when they have children, they may have children who have more neurological problems.

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