A Study on the Difference in Various Methods of Recollecting Words Between Mainstream Children and Children with Dyslexia

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Abstract: This study attempted to find out the difference in various methods of recollecting words among children with and without dyslexia. This study is descriptive in nature. The sample consisted of 60 children between the age group of 10-13 years. Purposive sampling method was adopted. The 30 children with dyslexia were taken from the special schools and 30 children without dyslexia were taken from mainstream schools. The study adopted three different recalling methods text visualization and written task, picture visualization and written task, picture visualization and verbal task. In the first method, the text visualization and written task, the participants were shown the list of ungrouped words for 60 sec and were asked to recall the words and jot them down on a sheet of paper within a minute and the same procedure was repeated for the grouped and gender specific word lists too. In the second method, picture visualization and written task, the participants were shown a number of pictures for 60 sec and were asked to recall the pictures and write their names within a minute. Finally, in the third method. Picture visualization and verbal task, the participants were shown the pictures and were asked to recall verbally which were then recorded separately for all the three methods. Results indicated that the children with dyslexia were able to recollect the words better when the words were presented under categories rather than in a random order. Their recalling performance was better in picture visualization and verbal tasks than in picture visualisation and written tasks.

Key words: Dyslexia, descriptive, grouped, ungrouped, gender specific, visualization

INTRODUCTION

Short-term memory also known as primary or active memory is the information we are currently aware of or thinking about. In Freudian psychology, this memory would be referred to as the conscious mind. The information found in short term memory comes from paying attention to sensory memories.

Recall or retrieval of memory refers to the subsequent re-accessing of events or information from the past which have been previously encoded and stored in the brain. In common parlance, it is known as remembering. There are three main types of recall Free recall, Cue recall and Serial recall. This study deals only with free recall method. Free recall is the process in which a person is given a list of items to remember and then is asked to recall them in any order hence, the name "free". This type of recall often displays evidence of either the primacy effect (when the person recalls items presented at the beginning of the list more often) or the recency effect (when the person recalls items presented at the end of the list more often) and also, the contiguity effect (the marked tendency for items from neighbouring positions in the list to be recalled successively). A model of free recall was proposed by Davelaar *et al.* (2005) in which recency in immediate free recall is produced by an activation-based short term store and recency in long-term is produced by a time-varying context signal through a weight-based long-term store in a free recall that is continuously distracted.

Literature review: Sederberg *et al.* (2010), suggested that in episodic recall tasks, performance is better when associations are formed and retrieved effectively between the nearby items of a list. Howard *et al.* (2006), Kimball *et al.* (2007), Polyn *et al.* (2009) and Sederberg *et al.* (2008) emphasized that the models of free recall suggests that the tendency to terminate recall increases after errors and that the items in the proximate list positions is retrieved during the recall of the items as the nearby items are associated during the study. The

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models showed that Prior List Intrusions (PLIs) and extra list intrusions are poor cues of recall which was supported by Zaromb *et al.* (2006) who showed evidence that Previous List Intrusions (PLI's) occurred more prominently which tended to come from the same prior list and that the PLIs lead to errors in recall and finally terminates recall. Rundus, 1971 have emphasized the importance of rehearsal processes in a number of free recall phenomena such as primacy effects and spacing effects have been found to be associated with rehearsal processes. The contiguity effect in free recall is persistent across different time scales (Howard *et al.*, 2008; Unsworth, 2008). For instance, Howard *et al.* (2008) presented participants with multiple lists of words with an immediate free recall task following each list. At the end of the experiment an additional final free recall task was given. Results showed that when participants recalled a word from a particular list, the next-recalled word tended to come from a neighbouring study position from the same list. However, if the next-recalled item did not come from the same list, the participants tended to recall another word from a nearby list (Unsworth, 2008). According to contextual coding models (Howard *et al.*, 2006), associations between contiguous items could result from those items having been stored with similar contextual or positional representations. Retrieving the temporal or positional context of a given item will serve as a cue for items studied in nearby list positions (Howard *et al.*, 2006). Episodic memory retrieval may rely on the representations within semantic memory and the ability to constrain search to intralist items may simply reflect the capability to exclude representations that have not been recently activated.

Park showed that encoding factors play a critical role in part-list inhibition (Park, 1981). For example, he found part-list inhibition when words were presented in a categorized list but part-list facilitation when the same words were embedded in sentences. If part-list inhibition is a consequence of the congruency between cues and the organization of items at encoding, then encoding factors should influence the amount of inhibition we observe as much as retrieval factors.

MATERIALS AND METHODS

Objectives of the study:
- To assess the difference between mainstream school children and children with dyslexia in recalling words from ungrouped word list, grouped word list and gender specific word list

- To assess the gender difference in recalling words from ungrouped word list and grouped word list among mainstream school children
- To assess the gender difference in recalling words from ungrouped word list, grouped word list among children with dyslexia

Hypotheses:
- There will not be any significant difference between mainstream children and children with dyslexia in recalling words from ungrouped word list
- There will not be any significant difference between mainstream children and children with dyslexia in recalling words from grouped word list
- There will not be any significant gender difference in recalling male related word list among dyslexic children
- There will not be any significant gender difference in recalling female related word list among children with dyslexia

Sample: The sample consisted of 60 children between the age group of 10-13 years. Respondents were taken from the special schools and others were normal school going children. Purposive sampling method was adopted. Mainstream children: 30, children with dyslexia: 30

The apparatus comprised of a stop watch, paper, pen and three lists of words (Appendix A) which were namely ungrouped words, grouped words and gender specific words. The lists had 20 words each. The ungrouped words were a random assortment of words belonging to the category games, months, flowers and directions put into four columns and five rows in random order. The grouped words contained the words organised under to the specific category. The gender specific word list was constructed with words mostly related to female gender like lipstick, bangle, hairclip, etc.

Method: The study adopted three different recalling methods as follows: Text visualization and written task the children were shown list of words and were asked to recall and write; Picture visualization and written task-the children were shown different pictures that they see in daily life and were asked them to recall and write it; Picture visualization and verbal/oral task the children were shown different pictures and were asked them to recall and were asked to tell them orally. In the first method three different list of words were prepared such as list of grouped words, list of ungrouped words and list of gender specific words. Each list had 20 words. The list of grouped words was

categorised under various headings such as vegetables, birds, fruits and electronic devices; whereas the list of ungrouped words was not categorised, i.e., the words in this list were from different categories such as games, flowers, months and directions but in a random order. The gender specific word list consisted of two sub lists one with words related to males and another related to females. Both the sub lists were presented to both male and female children with dyslexia. The participants were shown the list of ungrouped words for 60 sec and were asked to recall the words and jot them down on a sheet of paper within a minute and the same procedure was repeated for the grouped and gender specific word lists too.

In the second method the participants were shown the list of different pictures for 60 sec and were asked to recall the pictures and write in words the pictures they visualized within a minute. Finally, in the third method the participants were shown the pictures and were asked to recall verbally. Statistical analysis of mean, standard deviation and t-test were performed.

RESULTS AND DISCUSSION

From the mean score of the two groups it is evident that the normal children were able to recall the ungrouped word list better than the children with dyslexia as the latter group was unable to discriminate and categorize the words which plays a vital role in recalling. Hence, a significant difference (t-value of 8.04 ($p < 0.05$ Sig. level) existed between the normal and dyslexic children in recalling words from the ungrouped word list Table 1.

The children with dyslexia were taught to learn/memorize the words by "categorization". Then they were given a list of mixed words and were asked to recall them. The children used "categorization" method and it was found that they recalled better than before and no significant (Table 2).

From Table 3, t-value of 5.86 clearly indicates that there was a significant difference between male and female in recalling male related words at 0.05 level. Male dyslexic children were able to recall many words from the male word list as the words were related to males that they use in daily life.

The t-value of 3.15, it is concluded that there was a significant difference between male and female dyslexic children in recalling from gender specific word list related to females. Female dyslexic children got high mean score of 12.69 which clearly indicated that female

Table 1: Difference between mainstream children and children with dyslexia in recalling words from ungrouped word list

Type of word list	Type of children	N	Mean	SD	t-value
Ungrouped word list	Mainstream children	30	13.13	1.22	8.04*
	Children with dyslexia	30	10.13	1.63	

*$p < 0.05$ level of significance (2-tailed)

Table 2: Difference between mainstream children and children with dyslexia in recalling words from grouped word list

Type of word	Type of children	N	Mean	SD	t-value
Grouped word list	Mainstream children	30	16.47	0.937	1.86
	Children with dyslexia	30	15.97	1.120	

Table 3: Gender difference in recalling male related word list among children with dyslexia

Variables	Gender	N	M	SD	t-value
Male related words	Male	17	12.00	1.11	5.86*
	Female	13	9.38	1.32	

Table 4: Gender difference in recalling female related word list among children with dyslexia

Variables	Gender	N	M	SD	t-value
Female related words	Male	17	10.41	1.54	3.15*
	Female	13	12.69	1.79	

Table 5: Performance of mainstream children and children with dyslexia in recalling words from pictures in written and verbal tasks

Task	Type of children	N	Mean	SD	t-values
Picture visualization and written task	Mainstream children	30	15.10	1.125	11.31*
	Children with dyslexia	30	10.20	1.690	
Picture visualization and verbal task	Mainstream children	30	15.80	1.448	0.835
	Children with dyslexia	30	15.50	1.333	

*$p < 0.05$ level of significance (2-tailed)

dyslexic children were able to recall much better than male dyslexic children as the word list consisted words related to females (Table 4 and 5).

The words were presented in the form of pictures and the children were asked to recall them. The results showed that the recalling performance of children with dyslexia was significantly lower than the normal children when they were asked to write the words. They were not able to recall more number of words in the given time as their focus was more on correct word formation without spelling errors; whereas, the mainstream children performed excellently in the same task.

When the recalling performance for the images were tested verbally, there was no Sig. Difference found between the 2 groups. With this, it is concluded that the children with dyslexia find difficulty in written tasks, due to time consumption in forming words and spelling errors; whereas, the verbal tasks are performed with ease. The visual presentation is effective for the children with dyslexia when the outcome is expected in verbal terms

than in written. According to Karen, Dyslexia Victoria Online "to a dyslexic, some words are difficult to learn how to spell and remember if they can't easily visualize the idea of the words. They need context so, they can come up with a visual image to understand and remember words".

CONCLUSION

Among the three list of words used in the first method text visualization and written task, children with dyslexia performed equally well with the mainstream children in the list of grouped words rather than list of ungrouped words. Children find it easy to recollect the words in groups as categorizing brings in a clear view as in like chunking, than those placed randomly.

In the gender specific word list, children recollected the words related to their own gender better than the words related to their opposite gender. In the Second method-Picture visualization and written task, significant difference was found in the performance of the two groups, i.e., mainstream children performed well than the children with dyslexia. When it comes to the written task, the children with dyslexia find it difficult to write or compose words as their focus deviates to the spelling part which is the difficult part for children with dyslexia and hence, they consume lot of time in building words which ultimately lowers their performance in the picture visualization and written task. In the third method picture visualization and oral task, the children with dyslexia performed equally well with the main stream children as they were exempted from the written task which is usually a difficult part for the children with dyslexia.

RECOMMENDATIONS

Outcome of the research
- School teachers can use "Categorization" method to teach vocabularies
- Children with dyslexia can learn vocabularies easily by using "Categorization" method
- It emphasizes visual presentation method to the children with dyslexia to learn more vocabularies
- Picture visualization method is effective in learning words

Appendix: A
Ungrouped word list:
Carrot, Duck, Onion, Cot, Bear, Jasmine, Mobile Phone, Table, Ridge gourd, Lion, Computer, Crow, Bureau, Sunflower, Lotus, Parrot, Bulb, Ladyfinger, Elephant, Sparrow, Horse, Television, Tiger, Brinjal, Pigeon, Fan.

Grouped word list:

Cauliflower	Wood pecker	Bulb	Pineapple
Raddish	Peacock	Television	Mango
Bottle gouard	Eagle	Computer	Jackfruit
Beetroot	Ostrich	Mobile Phone	Pomegranate
Drumstick	Hen	Fan	Guava

Gender specific word list
Female: Actress, Landlady, Heroine, Handkerchief, necklace, Bangles, bride, jasmine, broom, handbag, lipsticks, Teddy Bear , Cooking, Pyjamas, Frocks, Saree, Bride, Long hair, book, Teacher.

Male: Hat, Bicycle, Groom, Perfumes, policeman, actor, Salesman, waiter, horse-riding, Shoe, gun, ball, cricket, car, watch, style, swimming, catch, school, Mobile, Game.

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