

Effects of Vocal and Subvocal Rehearsal on Recall

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ABSTRACT

Memory is a mental faculty that enables retention of information over time. There are three stages conceptualized in memory: Encoding, storage and recall. Information may be stored in short-term memory or long-term memory. Rehearsal techniques facilitate better retention and recall of information. Rehearsal can also be divided into two variants based on modality, namely vocal and sub vocal rehearsal. Some studies suggest that vocal rehearsal facilitate better retention and recall of information while some other studies claims sub-vocal rehearsal to be better. The current study tries to investigate the effect of the mode of rehearsal on recall in typically developing adults. 40 neurotypical adults divided into two groups, designated as group 1 and group 2 were considered for the study. Group 1 consisted of 20 individuals in the age range of 18-25 years while the second group consisted of 20 individuals in the age range of 55-60 years. 96 picture stimuli were used which were divided into two sets of 48 each designated as set 1 and set 2. Participants were asked to rehearse set 1 through vocal mode and set 2 through sub-vocal mode. Each correct recall of picture was given a score of 1. Results revealed the performance did not vary as a function of the mode of rehearsal for first group. Whereas, the performance varied as a function of the two modes of

rehearsals for second group with better performance for items recalled through the sub vocal mode.

Keywords: Memory, Rehearsal, Recall, Retention, Encoding

1. INTRODUCTION

Memory is a mental faculty that enables retention of information over time. There are three stages conceptualized in memory: Encoding, storage and recall. Encoding refers to the mental process of receiving, processing and combining of information. Storage refers to creating a record of the encoded information and recall refers to the act of retrieving this stored information. Information may be stored in short-term memory or long-term memory. Numerous studies have revealed that rehearsal techniques facilitate better retention and recall of information (Miller, McCulloch & Jarrold 2015).

Rehearsal can also be divided into two variants based on the modality namely vocal and sub vocal rehearsal. Vocal rehearsal involves repeating the target items aloud. Subvocal rehearsal on the other hand, involves the movement of muscles associated with speaking, without any verbal output. This internal speech cannot be detected overtly and may not be noticeable to speakers themselves.

Immediate recall tasks have been widely employed to tap individuals' short-term memory abilities. The phonological loop is a concept implicated in maintenance rehearsal that also acts as a function of short-term memory. It comprises of two components: Subvocal Rehearsal called the articulatory rehearsal loop and short-term store called the articulatory store. Subvocal rehearsal is said to constantly refresh memory traces of the items held in the short-term store. Thus, facilitating better performance in recall (Baddeley 2015). Research has indicated that sub-vocal rehearsal procedures produce a better performance in recall than vocal rehearsals (Fischler, Dewey & Atkinson 1970).

Some authors on the other hand, report a better improvement in recall abilities with overt or vocal rehearsal procedures (Bebko 1979).Whereas, some other studies suggest that rehearsal itself

plays little role in the development of verbal short-term memory performance in individuals (Jarrold 2013). Hence there exists a lack of consensus in literature regarding the effects of vocal and subvocal rehearsal procedures on verbal recall.

Need of the study

Rehearsal is known to facilitate recall, it varies as a function of the mode of rehearsal. Some of the studies in this direction have indicated that sub vocal rehearsal would be better than vocal rehearsal. While few other negate the view and claim and indicate that vocal rehearsal is better than sub vocal rehearsal. The current study tries to investigate the effect of the mode of rehearsal on recall in typically developing adults.

Aim

To investigate if the mode of rehearsal influences recall.

Objectives

To compare the performance of group 1 participants on recall for set 1 and set 2. To compare the performance of group 2 participants for set 1 and 2.

Methods

40 Neurotypical adults served as participants. The participants were divided into two groups, and the groups were designated as group 1 and group 2. Group 1 consisted of 20 individuals in the age range of 19-25 years while the second group consisted of 20 individuals in the age range of 55-60 years. Same number of males and females were considered in each of these groups.

Stimulus

The stimulus consisted of 96 pictures; the pictures were divided into two sets of 48 each designated as set 1 and set 2. The set 1 consisted of 48 pictures were presented in 6 stimulus sets. Each stimulus set comprised of 8 pictures. Set 2 consisted of same number of stimulus sets and the stimulus sets had same number of pictures. The pictures were presented through Power Point presentation. The participants were shown the pictures and were

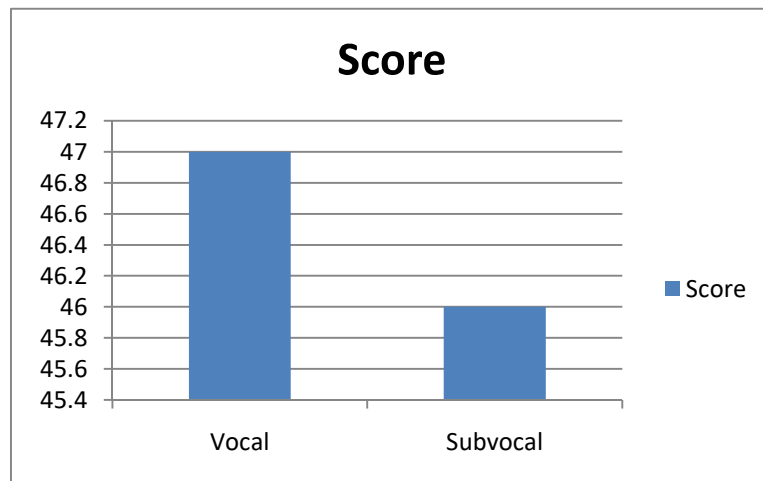
asked rehearse the first set of pictures (set 1) through vocal mode of rehearsal and second set of pictures were rehearsed through sub vocal mode.

Procedure

The participants were asked to carry out recall task, where the participants were asked to see the picture stimulus, remember the pictures, and rehearse the names of pictures through vocal mode for set 1 and through sub vocal mode for set 2. Vocal rehearsal referred to the process of overtly mentioning the labels while sub vocal rehearsal referred to process of silently rehearsing the item label. The participants were asked to vocally or sub vocally rehearse in between the picture presentations.

Results and discussion

Serial recall was used to test recall, where the participants were asked to adhere to the order of stimulus representation. Each correct recall of picture was given a score of 1. The maximum score which could be obtained for each stimulus set was 8 and the maximum score for set 1 and set 2 was 48 respectively (8*6 stimulus sets). Scores were tabulated separately for set 1 and set 2.



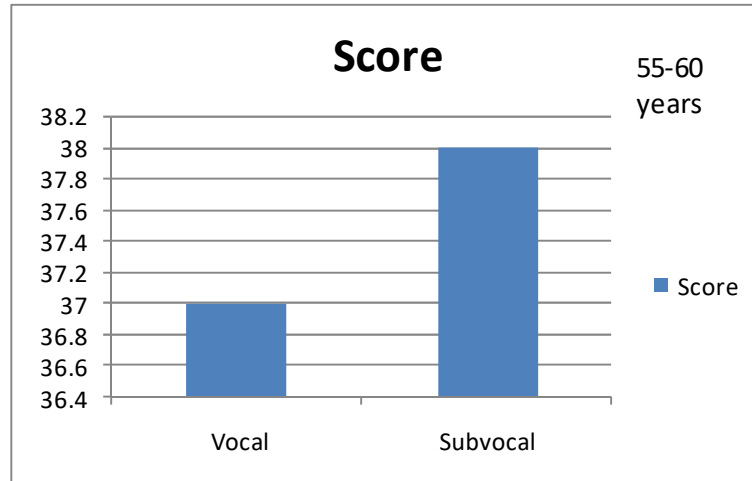


Figure 1. *Performance on vocal and sub vocal rehearsal trials*

Group 1 participants secured a score of 47 for set 1 and 46 for set 2 while group 2 participants secured a score of 37 for set 1 and 38 for set 2.

The objectives of the study were to compare the performance on recall for set 1 and set 2 in group 1 and group 2 participants separately. Between group comparisons was not done as it was not the part of coined objectives. As the data abided by properties of non normal distribution, Wilcoxon's signed rank test was used and Z score obtained by comparing the recall on set 1 and set 2 for group 1 and group 2 was 1.72 and 3.12 and corresponding value showed significant difference only for group 2.

Group 2 referred to older participants and this group of participants performed well on set 2 i.e. for the items rehearsed through sub vocal mode of rehearsal compared to set 1, this showed that sub vocal rehearsal was better than vocal rehearsal. When the items are rehearsed overtly the lexical node would impede the recall of the next item and this phenomenon would be seen more in older adults owing to which recall would have varied as a function of the mode of rehearsal especially for this group. The younger individuals on the other hand would not have

experienced inhibition for items presented through vocal mode as a result, the results may not have shown significant difference.

2. CONCLUSIONS

The study was carried with aim of investigating if the mode of rehearsal influences recall. The participants were divided into group 1 (19-25 years) and group 2 (55-60 years) with 20 participants in each group. The participants were asked to recall pictures.

The pictures were presented in two sets. Items in first and second set was rehearsed through vocal and sub vocal mode of rehearsal. The performance did not vary as a function of the mode of rehearsal for first group while the performance varied as function of the two mode of rehearsals for second group with performance better for items recalled through sub vocal mode.

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