

Original Paper

Interference and Morphological Recall in Young and Middle-aged Individuals

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Abstract

Recall refers to the retention of information, it involves three stages namely encoding, storage and retrieval. Interference in recall would arise when there is a competition at the stage of encoding. Recalling morphological information is assumed to load the cognitive-linguistic system and recalling the same information in the presence of competitor stimulus can evoke more taxing to the system. The current study was carried out with the aim of studying interference and recall in young and middle aged individuals. The participants were divided into two groups based on their age and each group comprised of 25 individuals. Free Recall and bound Recall task was administered on the participants. Participants in both the group secured less scores, however a statistically significant difference between the two groups was not seen showing that the middle aged adults were also able to perform in par with younger participants and decline in memory was not evident in this population, even in task with higher cognitive-linguistic complexity.

Keywords

storage, retrieval, access, lexical competition

1. Introduction

Memory refers to the process of retaining information over time (McLeod, 2007). Recall includes the storing, encoding, and retrieval of information (Mahajani et al., 2023). Verbal memory and language are interdependent. There is significant evidence demonstrating the effect of linguistic variables associated with recall. For instance, there is a plethora of studies on the easier recall of semantically related over unrelated items (Porier & Aubin, 1995) However the same cannot be generalised on the signifying role of morphological information on recall. There is a clear sparsity of studies in this

direction. For instance, a study by Service and Tujulin (2002), highlighted that the participants found it more challenging to recall inflected and derived word forms compared to base forms. A study carried out by Nemath et al. (2015) showed that the models of verbal recall may not gel well with recall of inflected and derivational morphemes resulting in variations in recall. It is noteworthy that the morphological structure of each language is different, and the effect of linguistic variables has not been tested in Kannada language.

Interference refers to an impaired ability to remember an item when it is similar to other items stored in memory (Anderson & Neely, 1996). Recall in interference condition is speculated to make it hard/difficult for the early middle-aged or late middle-aged to retrieve the given information increasing the matter of concern. There is no study incorporating the interference paradigm in recall of morphological information, this necessitated the current study.

Need of the study: Despite a substantial amount of research emphasizing the effect of language on recall abilities it is still unclear how morphological variable and interference affects the recall abilities in young and middle-aged individuals.

2. Method

2.1 Study Design and Participants Details

A total of 50 native Kannada speaking participants were chosen via convenient sampling. The participants were divided into two groups. Group 1 consisted of 25 participants from 18 to 35 years and Group 2 had 25 participants from 36 to 60 years of age. Recall under interference task was administered on the participants in two conditions as explained below.

2.2 Stimulus and Procedure

Task 1 involved recall of free morphemes (stand-alone words) and Task 2 recall task involved recall of bound morphemes (where a suffix to the root word was added), both tasks under interference condition. Six units were used as competitive stimulus as well as the target. The competitive stimulus was recorded in female voice while the target voice was recorded in male voice to enable differentiation. After the presentation of the 12 units participants were asked to recall only the 6 target units in the male voice for both task 1 and task 2. The order of recall was not constrained as it was a free recall task. The only difference between the two tasks was that, the target and competitive stimulus for task 1 comprised of free morphemes, while for task 2 it comprised of bound morphemes. The inter-stimulus duration between each stimulus was 3 seconds. The participants were given one minute after the presentation of the stimulus and they had the flexibility of carrying out sub-vocal rehearsal during the time gap.

2.3 Scoring

Each correct recall (regardless of the order) yielded a score of 1, the maximum score for free and bound morpheme recall was 6 respectively. The mean scores for Task 1 and Task 2 were computed and analysed for determining within-group and between-group differences.

3. Results

The median scores were computed and analysed for group 1 and group 2 participants on the free recall with interference and bound recall with interference tasks. The median score for group 1 and group 2 participants on free morpheme recall with interference task was 3.00 and 2.96 respectively. While the median scores for the two groups on bound morpheme recall with interference were 2.00 and 1.00 respectively. The primary objective was to compare the performance of younger (group 1 participants) and middle-aged (group 2) participants on the free recall with interference and bound recall with interference conditions.

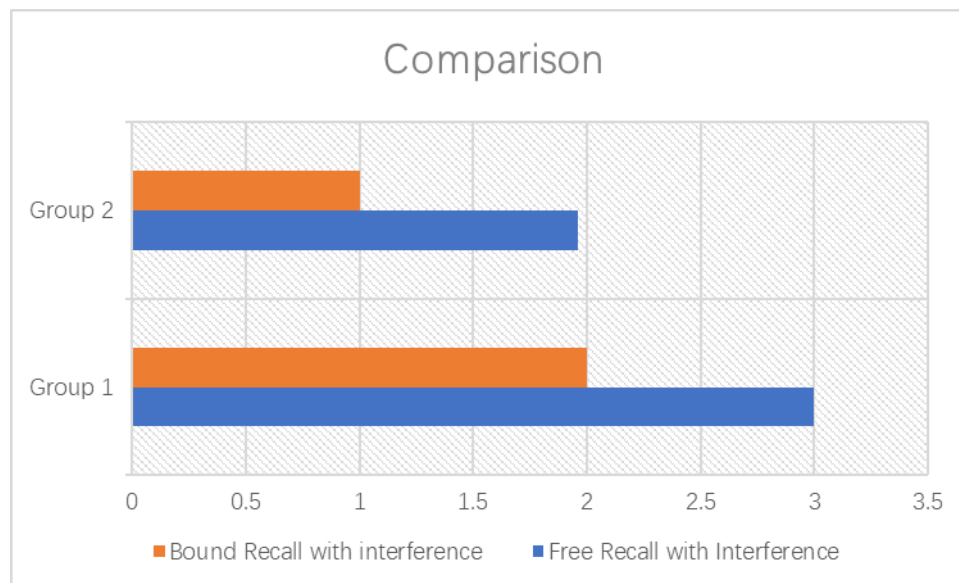


Figure 1. Comparison of Group 1 and Group 1 on Free and Bound Recall with Interference Conditions

The data did not abide by properties of normal distribution as shown on Shapiro-Wilk's test of normality ($p < 0.05$). Hence Mann Whitney U test was used for comparison and the Z score of 0.04 and 0.36 was obtained for the conditions respectively. The corresponding p values showed no significant difference between the two groups respectively for both the conditions. The secondary objective was to compare the within group difference for group 1 and group 2 separately on the two recall conditions (free recall with interference and bound recall with interference. Wilcoxon's signed rank test for comparison (as even this data did not abide properties of normal distribution) and the Z score of 1.36 and 2.14 were obtained for the two groups respectively. The corresponding p values showed no significant difference for group 1 however there was a significant difference for group 2 in the performance on free and bound recall. Between-group difference revealed no significant difference for the two groups.

4. Discussion

The claim is that middle-aged adults will not perform in par with young adults on cognitive tasks. However, this claim was negated in the current study. The middle-aged adults used meta-cognitive strategies like mnemonic strategies and formed a sequence based on the items presented, which enabled them to perform in par with younger adults who also used the same strategies as reported. This holds true for both free and bound recall conditions. Though the participants had the flexibility of recalling in any order, the participants adhered to the order which culminated evidence for use of meta-cognitive strategies. While the second objective showed slightly different findings, as there was a within-group difference for group 2 only. This objective dealt with the performance on free and bound morpheme recall with interference conditions. The bound recall condition with interference imposed high cognitive-linguistic constraint and this effect was more robust in the group 2 participants. Adjunct analysis revealed that the participants transposed the root word and bound morpheme more frequently leading to errors. The current study is a preliminary study using morphological recall under interference conditions making it difficult to compare with previous studies owing to methodological differences.

In Summary, the study aimed to compare the performance of younger and middle-aged adults on free and bound morpheme recall. There was no difference between the two groups on either of the tasks. However, the within-group difference was seen on comparing the performance of middle-aged under-free recall and bound recall with interference conditions highlighting the role of task complexity and increased cognitive-linguistic load in middle aged adults. Further, the study can be extended by using serial order recall to further verify the effect of complexity and can be extended to older population (above 60) to test the effect of age in a continuum.

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