**Research Paper**

# The Multifaceted Aspects in Novel Word Learning After Critical Age: An Investigation on the Potential Variables

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## ABSTRACT

Learning is an ongoing process, the learning is at its peak in the critical age. Learning second language is always been an enigma and has attracted mixed views. The current study was carried with the aim of investigating the multifaceted nature of novel word learning after critical age. The study was carried out in Hindi. 20 neuro-typical adults in the age range of 18-30 years were considered for the study. All the participants were native speakers of Malayalam. Baseline assessment was carried out with the motive of ensuring that the participants did not know the words used in the main study. A total of 30 stimulus was used and the stimulus was divided into two subsets. The first subset was taught to the participants using pictures and the second subset was taught through semantic description. Learning was assessed at two-time intervals: immediate and delayed recall. Results showed that there a significant difference between the stimulus sets indicating that this was a potential variable influencing novel word learning.

The critical age hypothesis is very popular with developmental neuro-psychologists and speech language pathologists. The hypothesis states that language learning is at its peak between the early childhood and puberty. This claim has received support as well as criticisms. The main criticism is derived through studies carried out on English Second Language Learners (ESL). For instance, a study carried out by Kouritzin (2000) reported that non-native speakers exceeding the critical age also could learn English as second language with some intense and systematic learning. Another study carried out by Von Hoene (2000) has also seconded this claim. Fast mapping and slow mapping are considered as experimental methods used in investigating novel word learning (Carey & Bartlett, 1978; Clark1993). These methods can be used in children learning first and second languages. The same method has been extrapolated to second language learning as well. However, there is dearth in the number of studies carried out in second language learners limiting the generality of the method in investigating novel word learning.

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**The Multifaceted Aspects in Novel Word Learning After Critical Age: An Investigation on the Potential Variables**

The current study investigated the effects of some potential variables on novel word learning some of the variables include the method used in teaching novel words. The novel words can be taught through slow and fast mapping methods. The efficacy of these methods has not been tested especially while dealing with the population which has exceeded the critical age, dealing with a foreign language. The role of memory in learning novel words has also not been investigated in regard to this population and the given context, to the best of our knowledge. This was tapped/tested through the delayed recall task used in the study.

*Aim of the study:*
To determine the variables related to novel word learning in neuro-typical adults who have exceeded the critical age.

*Objective of the study:*
- To compare the number of words learnt using fast mapping and slow mapping on immediate naming task
- To compare the number of learnt using fast mapping and slow mapping on delayed naming task

## METHODS

*Participants*
20 neuro-typical adults were enrolled for the study. All the participants were females and were selected based on convenient sampling. All the participants were Malayalam speakers and had English as their L2. Some of them had studied Hindi as their L2 in their academic curriculum. The current study was carried out with the aim of investigating the potential variables related to novel word learning in L3 (Hindi). The participants were not exposed to L3: Hindi on day to day basis.

*Stimulus*
30 novel Hindi words were selected by the investigators and baseline tested was carried out on the participants. The participants were asked if they were familiar with the given word. A cut off 3 was applied in other words if the participants reported that they were familiar the participants were not considered for the next phase of study and were replaced by other participants to account the sample size to be 20. Following the confirmation, training was imparted.

*Procedure*
The 30 novel Hindi words were divided into two subsets of 15 each. The first set of 15 words each were shown as pictures plus the labels were presented to the participants in broad transcription forms. The second set of 15 words were presented to participants in two forms. The first presentation form included the presentation of linguistic labels and the second form included the presentation of details related to the target word. In other words, semantic descriptions were provided for these words. The stimulus sets were presented as Power Point Presentation. The order of presentation was counter balanced across the participants and the training was provided individually.

**Scoring:** Each stimulus set was scored separately. The maximum score for each stimulus set was 15. The number of words learnt was tested through immediate and delayed naming tasks. In the immediate naming task, the participant was asked to recollect the items learnt

immediately after the training and on the delayed naming task, the participant was asked to recollect the items learnt after a lapse of 2 days.

## RESULTS

The study addressed two objectives, the first objective dealt with the comparison of the number of learnt using fast mapping and slow mapping on immediate naming task and delayed naming tasks. The fast mapping was tested through the first stimulus set while the semantic mapping was tested through the second language set. The maximum score was 15 or each stimulus set. For immediate recall on the first stimulus set, the average score was 12 while average scores on the second stimulus set was 8. On delayed naming task, the scores for the first and second stimulus set was 10 and 4.3 respectively.
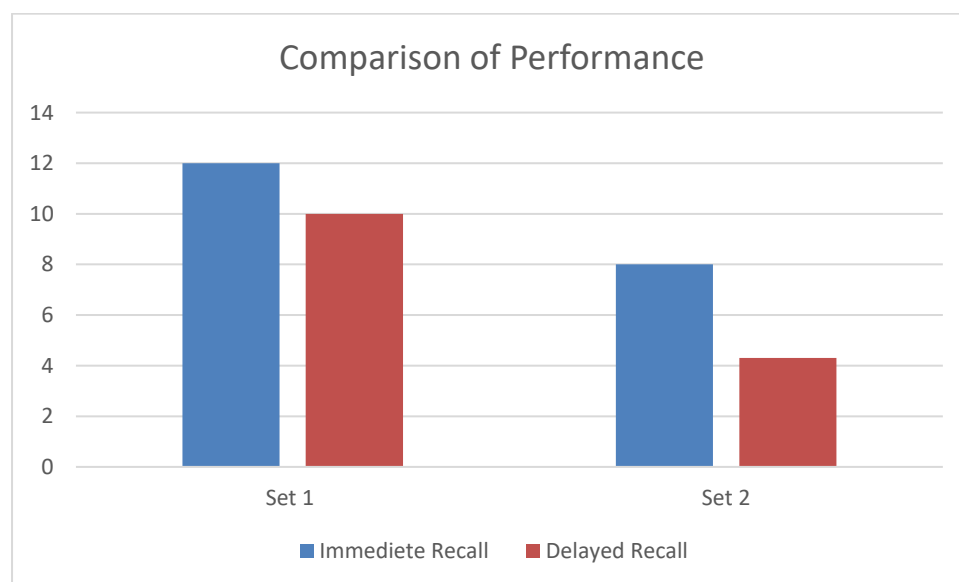


*Figure 1: Comparison of performance on stimulus set 1 and 2*

The data was subjected to the test of normality using Shapiro-Wilk's test of normality and the p score was less than 0.05 indicating that the data was non-normal. In order to compare the two methods of training, the scores on the first and second stimulus sets was compared for immediate naming and delayed naming. Wilcoxon's signed rank test was used for comparison and the Z score obtained was 3.12 and 2.34 the two respectively. The corresponding p values showed significant difference between the stimulus sets for both immediate as well as delayed naming tasks. The median scores were superior for the first stimulus set compared to the second stimulus set indicating that the use of picture was more effective in training. In addition to the pre-set objectives, additional analyses was carried out. In the additional objectives the performance on immediate naming was compared with the performance on delayed naming task for the two stimulus sets. For stimulus set, the Z score obtained was 1.18 (p>0.05) for stimulus set 2, the Z score obtained was 1.96 (p>0.05) indicating that there was no significant difference between immediate naming and delayed naming across the two stimulus sets (method of teaching).

The results clearly showed that the method of teaching evoked difference in the performance. In the first method, the pictures along with the broad transcription of the linguistic label were presented to the participants. In the second method, the stimulus was presented in two forms i.e. label in broad transcription form and semantic description form.

The stimulus was divided into two stimulus sets and was designated as stimulus set 1 and 2. The results of Wilcoxon's signed rank test suggested there was significant difference for the stimulus sets, in other words, the method of teaching the novel words evoked a difference. The fast-mapping method was effective in teaching novel words from an unfamiliar language even in participants who crossed their critical age.

The performance was tapped on two-time intervals namely immediate naming and delayed naming conditions. The results on Wilcoxon's signed rank test suggested no difference since neuro typical adult speakers in the age range of 18-25 years were considered for the study, two speculations can be raised from this finding. The first presumption could be that the participants had god memory skills owing to this they performed better, the second claim would be that the words were learnt in both methods regardless of the variation in the teaching method as a consequence there would have been no difference in the performance. The basic limitation of the study is that it was done on only 20 adults limiting the generality. Conclusions: The neuro-typical adult speakers have the ability to learn novel words even after exceeding the critical age, however the method of training used in teaching novel word would have a significant effect.

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*Conflict of Interest*
The author(s) declared no conflict of interest.