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What Would Influence Primacy and Recency Memory in Serial Position

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Abstract: The word at beginning and end of the list is easier to be remembered than the word in middle of the list. In some cases, however, this advantage does not exist. This article will summarize the factors found in previous studies to influence the primary and recency effects in three area, emotion, retention interval and language. negative information has a stronger primary effect. The primacy effect prevailed when delays were longer; the recency effect prevailed when retention intervals were short. Bilinguals' first language shows stronger pre-recency effects than second language. This article will help to understand how memory works in a free recall task

Keywords: Primacy, Recency, Emotion, Retention interval, Language

1. Introduction

1.1. Background

Free recall is a typical task in the psychology of memory research. Participants in this task examine a list of objects on each trial before being asked to recall them in any order [1]. A well-known finding is that performance on the free recall task is characterized by a unique U-shaped serial position curve, with items at the beginning and end of the list remembered more accurately than those in the middle (primacy and recency effects, respectively). One of the most convincing explanations is dual-component model. The short-term memory (STM) and long-term memory (LTM) were proposed as the two memory systems that contributed to performance on the free-recall task in the dual-component model (LTM). The words midway through the list were displaced and were therefore both too long for short term memory (STM) and too short for long term memory (LTM) storage [2, 3]. However, the performance on the free- free recall task did not always display as a U-shaped, in some situation, it would nearly be J -shaped.

1.2. Aim

What affects U-shaped to J-shaped has not been specifically investigated but has mostly been discovered in studies exploring the processes of memory mechanisms. This paper summarizes the primary and proximate effects that affect the series and provides a preliminary explanation based on the process of their discovery in conjunction with memory theory.

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2. Analyzing

2.1. Emotion

Snyder firstly found the effect of emotion on primacy and recency effects [4]. Participants who received the positive list demonstrated an augmented recency effect, whereas those who received the negative list demonstrated an amplified primacy effect [4]. Demaree replicated this experiment and added female participants and the variable of level of hostility [5]. However, no effect of hostility level on the primacy and recency effects was found. Demaree found the same result as Synder that the negative affective list had a primacy impact, and the positive affective list had a recency effect [4]. The explanation for this phenomenon is based on a combination of Murdock's principles to produce primacy effects and Kensinger's effects of negative emotions on long-term memory. Because words at the top of a list are more likely to be maintained in long-term memory, this phenomenon is known as the primacy effect [3]. In the long-term memory, negative information is easier to retain than neutral information [6]. Negative information at the front of a word list is more likely to be stored in long-term memory, so negative information has a stronger primary effect. Another explanation is based on Ellis & Ashbrook and Kensinger for the influence of emotion on working memory and Murdock's explanation of the principles of recency effect. Negative emotions can lead to more non-task related thoughts, which can overload working memory [7]. The last words in the list go into short term memory (recency effect) and short-term memory can usually hold about 7 items [3]. Although emotional content does not significantly affect working memory, emotional salience can occasionally impair working memory function [6]. Negative emotions therefore affect the capacity of working memory, and the recency effect of working memory is naturally affected, thus underscoring the importance of the primacy effect in negative situation. These explanations are in terms of negative emotions, as there is less research on the effects of positive emotions on memory.

2.2. Retention Interval

The interval between the receipt of the word list stimulus and immediate recall affects the primacy and recency effects. This was discovered by designing experiments to demonstrate that the dual-component model could account for the U-shaped serial-position curve. After the words were presented, one group remembered them right away, while the other group remembered them after a 30-second delay [2]. Only when the list's final phrases are first recalled and tested right away do they become memorable. The recency effect was eliminated by delaying recall by 30 seconds [2]. Recent research used a recognition task and discovered both recency and primacy effects between 5 and 25 sec [8]. Korsnes (in press) proposed that when retention intervals were short, the recency effect predominated; when delays were greater, the primacy effect predominated [8]. Studies by Neath and Wright et al. produced a primary effect at a retention interval of 5 seconds, while neither provided a primary effect at a retention interval of 0 seconds [9, 10]. Korsnes found that although primacy effects were indicated, recency effects predominated at 5 sec, and primacy effects predominated at 25 sec [11]. and then Korsnes replicated the experiment done by Korsnes and added 15 second group. Korsnes discovered the same result as Korsnes in 5 sec and 25 sec, while there was no significant difference between the primary and recency effects at 15 seconds [12]. Both studies concluded that the primary effect occurs after five seconds, and that the recency effect dissipates between 15 and 100 seconds. This may be because the words in front of the word list do not have enough time to enter long-term memory within 5 seconds, while the words after the 15-second delay do not enter short-term memory because they are too long.

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2.3. Language

In the effect of language on primacy and recency effects we will compare performance of bilinguals' first language and second language. Yoo and Kaushanskaya investigated sequence position effects in a free recall task for Korean-English bilinguals in their first and second language [13]. The findings showed that L1 and L2 had equivalent recency effects but that L1 had larger pre-recency (primacy and middle) effects than L2. The speakers appeared to be able to enable free recall in their L1 by using their linguistic knowledge (LTM) more effectively. Since L1 is their more fluent language, it is likely that they will be able to practice the first item on the list more effectively there than in L2, which is their less fluent language. For shorter lists (10 and 15 words), the native-language recall advantage was visible in the pre-recency zone; however, for the largest list, it was visible in the recency region (20-word list). This explains the overall result of L1 advantages in the pre-recency but not the recency area since the recency impact in the L1 for 20-word lists washed out by non-significant recency effects in the L2 for 10- and 15-word lists. Cowan proposes a capacity limit for attentional focus and claims that STM capacity estimates fall within a limited range of explanations as another explanation for this occurrence [14]. Recall of longer lists (rather than shorter lists) may involve a reliance on attentional focus mechanisms. The advantage of longer lists in L1 recall may be since longer lists require the recruitment of additional attentional resources, which are more efficiently utilized in L1 than in L2.

3. Conclusion

Negative mood, extended retention interval and bilingual first language all show stronger primacy effects. The dominance of the recency effect is shown only when the retention interval is short. There is much evidence that people's memories are affected by emotions, but the reasons for this are not known. How the brain processes emotion-based information on memory needs to be studied in the future. If emotions have a reinforcing or mitigating effect on memory, then in the future people may be able to control memory by controlling their emotions. In terms of the effect of the retentive interval on the primacy and recency effects of the free recall task, it was determined that the recency effect began to diminish when the retentive interval reached 15 seconds. At this stage of the study, it was not possible to determine whether the primacy effect increased significantly after 5 seconds. Research on the effects of language on memory is relatively recent and therefore less studied. In Yoo and Kaushanskaya's study of Korean-English bilinguals, English was acquired later, so there was a difference in proficiency. If the two languages were acquired innately and the proficiency in both languages was the same, would there still be a difference when the test was administered?

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