

**Iteration 4: Research Proposal**  
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The serial position effect is a psychological phenomenon that describes our tendency to remember the first and last items on a list more easily than those in the middle. This effect has been extensively studied and is believed to be due to differences in how our brain processes and stores information. In practical terms, the serial position effect has important implications for many areas of life, such as website design, advertising, and memory improvement techniques.

## **Review of Articles**

### **Paper 1: The Influence of Commodity Presentation Mode on Online Shopping Decision Preference Induced by the Serial Position Effect**

In the first article, when designing a website, developers often place the most important information or products at the beginning and end of the page, where they are more likely to be noticed and remembered. Similarly, in advertising, companies may strategically place their ads at the beginning or end of a TV commercial break, knowing that these are the times when viewers are most likely to pay attention.

Moreover, the serial position effect can be used to improve memory performance. For instance, when trying to remember a list of items, one could try to group them into smaller chunks and focus on remembering the first and last item of each chunk, which can make it easier to remember the entire list. This technique is known as the "chunking" method and is widely used in education and memory training.

In conclusion, the serial position effect is a fascinating phenomenon that has significant practical applications. By understanding how our brains process and store information, we can use this knowledge to improve our memory, design more effective websites, and create more compelling advertising campaigns.

### **Paper 2: Serial Position Effects in the Identification of Letters, Digits, and Symbols**

The second study examines how the visual system adapts to optimize the identification accuracy of alphanumeric stimuli, such as letters, digits, and symbols, based on the demands of reading. The study conducted several experiments using a two-alternative forced-choice procedure to measure the accuracy of identifying targets in strings, with independent variables including the type of target and its position in the string.

The study found that letters and digits have a first-position advantage over symbols, with higher levels of performance when presented at the beginning of a string. This advantage persisted even when different types of targets were randomly intermixed, and when letters were embedded in symbol strings and vice versa. However, the study has some limitations, such as an unspecified sample size and a lack of investigation into the effect of language or cultural differences on visual processing.

Overall, the study suggests that information systems that present alphanumeric stimuli can benefit from considering the constraints of reading words and numbers and

how the visual system adapts to optimize their identification. This understanding can lead to the development of more effective and user-friendly information systems.

### **Paper 3: Serial Position Effects in Recall of Television Commercials**

The third study examined the effects of primacy and recency in memory for television commercials, with a focus on controlling for factors that may affect memory performance. While prior research has shown that primacy and recency effects exist in memory for various types of stimuli, including commercials, this study aimed to test these effects in a more controlled laboratory setting.

The study used a sample of 105 participants and manipulated the order and duration of commercials within lists, while testing both recall and recognition in surprise and expected conditions. The independent variables were the order of presentation and duration of commercials, while the dependent variable was recalling performance. Confounding factors were not explicitly addressed in the study.

Results showed a strong primacy effect, with commercials presented in the first positions of the lists being better recalled than the same commercials presented later in the list. However, the study did not find a consistent recency effect. The results contribute to our understanding of memory for commercials and confirm previous findings regarding the primacy effect. The study also emphasizes the importance of controlling for factors that may affect memory performance, such as the order of presentation and list length.

The limitations of the study include the use of a laboratory setting, which may not fully replicate real-world memory performance, and the focus on explicit recall, which may not be the most important measure of memory for commercials in real-world settings. The implications for the development of information systems are not entirely clear, as the focus of the study was on basic research in memory psychology rather than practical applications.

In summary, this study provides important insights into memory for television commercials, particularly regarding the primacy effect, and highlights the need for careful control of experimental factors in such research. However, the limitations of the study suggest that further research is needed to fully understand memory for commercials in real-world settings.

### **Paper 4: When the Best Appears to Be Saved for Last: Serial Position Effects on Choice**

The focus of the fourth investigation is the influence of serial position effects on decision-making. The research investigates how the sequence of presenting alternatives can impact individuals' decisions, even when those decisions may not be the optimal ones.

Studies have shown how things are arranged can affect what we choose. For instance, the order in which products are placed on a store shelf can make a difference in

which one we end up picking. What is the impact of the sequence in which choices are presented on decision-making, and what is the rationale behind this effect? The study utilized multiple experiments where participants were given a series of options and requested to choose their preferred one. The options ranged from snacks to movies, and their presentation order was either randomized or arranged in a specific order, with the best option presented last. The independent variable was the order in which the options were presented, while the dependent variable was the participant's choice. To eliminate any confounding variables, participants were randomly allocated to different presentation orders. The study was empirical and comprised sample sizes ranging from 70 to 240 participants per experiment.

Participants tended to select the final option, even if it was inferior to earlier alternatives. The authors propose that this outcome may be attributed to a primacy bias, where individuals tend to recall the first and last items in a series more distinctly than those in between.

The study has multiple contributions, such as presenting factual proof of the influence of serial position effects on decision-making and emphasizing the significance of comprehending cognitive biases in decision-making. Moreover, the findings have implications for different areas of study, such as marketing and consumer behavior, by proposing that altering the sequence of presenting options can be utilized to influence consumer decisions.

A drawback of the research is that it was carried out in a controlled laboratory environment, which may not entirely replicate decision-making in the real world. Additionally, the study solely focused on analyzing the effect of the sequence in which alternatives were introduced, and it did not explore other variables that could impact decision-making.

The possible outcomes for creating a particular type of information system is that the user interfaces and designs can be enhanced to utilize the serial position effect. An example is presenting options in a manner that raises the probability of selecting a particular option in a software application. Nonetheless, conducting controlled experiments is necessary to determine the impact of distinct interface designs on decision making. A subsequent investigation could explore how the order of presenting options on a user interface influences people's choices and how diverse designs can be enhanced to exploit the serial position effect.

The study offers concrete evidence regarding the influence of serial position effects on decision making and emphasizes the significance of recognizing cognitive biases in this process. The research has potential implications in a range of fields, such as marketing and consumer behavior, and suggests that user interface and design could be optimized to leverage this phenomenon. Nonetheless, more studies are required to assess the effect of diverse interface designs on decision making in a closely monitored experimental setup.

**Paper 5: Serial position effects in implicit memory for multiple-digit numbers**

The final research investigates how serial position effects impact implicit memory retention of multiple-digit numbers. The authors specifically aim to determine if the location of a number within a list has an impact on the probability of it being remembered.

Previous studies have shown that the serial position effect is a reliable occurrence in memory. The primacy effect pertains to superior recollection of items at the start of a list, whereas the recency effect pertains to superior recollection of items at the end of a list. However, there is limited knowledge regarding the impact of serial position on implicit memory for numbers.

This study aims to explore whether the location of a digit in a series has an impact on its probability of being remembered in the implicit memory of multi-digit numbers.

The research methodology consisted of an empirical investigation, which utilized a sample of 30 individuals. The study's independent variable was the placement of a number within a list, while the dependent variable was the probability of its retention in implicit memory. A within-subjects design was implemented, where each participant was exposed to six sets of 12 numbers, presented in a random order. Participants were requested to identify if each number was new or old, without being explicitly prompted to recall the numbers.

According to the study, there was a notable impact of serial position on implicit memory for numbers with multiple digits. The research participants had a higher likelihood of accurately recognizing numbers positioned at the start and end of the list, as opposed to those located in the middle. The authors proposed that this outcome may be attributed to both the primacy effect and recency effect.

The research enhances our comprehension of serial position effects in implicit memory pertaining to multi-digit numbers. The results indicate that the placement of a number within a series can influence its chances of being remembered, which has practical implications for creating memory-focused information systems.

The study has a restricted sample size which could constrain the applicability of the results. Furthermore, the research exclusively scrutinized implicit memory concerning numbers with several digits, leaving uncertainty about the generalization of outcomes to other stimuli categories.

Password systems could consider the impact of serial position effect to enhance password retention. To achieve this, the system could suggest users create passwords that consist of a combination of numbers placed at the start, middle, and end of the list. This approach could improve the likelihood of users remembering their passwords, even when they are not making a conscious effort to recall them.

In the future, an investigation could verify this implication by evaluating how well individuals can remember passwords created using the serial position effect. To enhance the validity of the findings, a more extensive sample size could be employed, and various kinds of stimuli could be introduced. Furthermore, the study could compare the capacity to recall passwords generated utilizing the serial position effect to passwords generated randomly or without consideration of serial position. This comparison would provide more proof for the efficacy of using the serial position effect to create passwords.

## Summary of Articles

### **Paper 1: The Influence of Commodity Presentation Mode on Online Shopping Decision Preference Induced by the Serial Position Effect**

The article discusses the serial position effect and its practical applications in web design and advertising. The effect involves remembering the first and last items in a list more easily, which can be used to improve memory performance through the "chunking" method. The article highlights the importance of understanding how our brains process and store information to create more effective designs and advertising campaigns.

### **Paper 2: Serial Position Effects in the Identification of Letters, Digits, and Symbols**

The study aimed to examine how the visual system adapts to optimize identification accuracy of alphanumeric stimuli based on the demands of reading. It found that letters and digits have a first-position advantage over symbols, even when randomly intermixed. The study suggests that information systems can benefit from considering these constraints to develop more effective and user-friendly systems.

### **Paper 3: Serial Position Effects in Recall of Television Commercials**

The study aimed to examine the effects of primacy and recency in memory for television commercials by controlling factors that may affect memory performance. The study found a strong primacy effect, but no consistent recency effect. The study emphasized the need for careful control of experimental factors and confirmed previous findings on the primacy effect. The study provides important insights into memory for television commercials, but further research is needed to fully understand memory for commercials in real-world settings.

### **Paper 4: When the Best Appears to Be Saved for Last: Serial Position Effects on Choice**

This study investigates how the order in which choices are presented can impact decision-making and suggests that people tend to choose the last option even if it is inferior, due to a primacy bias. The study was conducted through multiple experiments with varying sample sizes and found that the sequence in which options were presented was the independent variable that influenced participants' choices. The study highlights the importance of understanding cognitive biases in decision-making and proposes that altering the order of options can be utilized to influence consumer decisions. The study has potential implications for designing user interfaces and optimizing them to leverage the serial position effect.

#### **Paper 5: Serial position effects in implicit memory for multiple-digit numbers**

This study examines the impact of the serial position effect on implicit memory retention of multiple-digit numbers. The authors find that the primacy and recency effects influence the probability of numbers being remembered, with better retention at the beginning and end of a list. The study suggests practical applications for memory-focused information systems, such as suggesting users create passwords that utilize the serial position effect.

### **Analysis of Articles**

The five papers discussed different aspects of the serial position effect and its impact on human behavior and cognition. They suggest that the order in which information is presented can significantly influence memory, decision-making, and user engagement. Specifically, the papers highlight the following:

- Paper 1: The serial position effect can be used to improve memory performance in web design and advertising campaigns.
- Paper 2: The visual system adapts to optimize identification accuracy of alphanumeric stimuli based on the demands of reading, with letters and digits having a first-position advantage over symbols.
- Paper 3: The primacy effect has a strong influence on memory for television commercials, but further research is needed to fully understand memory for commercials in real-world settings.
- Paper 4: The order in which choices are presented can impact decision-making, with people tending to choose the last option even if it is inferior due to a primacy bias. Altering the order of options can be utilized to influence consumer decisions.
- Paper 5: The primacy and recency effects influence the probability of remembering multiple-digit numbers, with better retention at the beginning and end of a list. This finding suggests practical applications for memory-focused information systems, such as suggesting users create passwords that utilize the serial position effect.

Overall, the papers highlight the importance of understanding the serial position effect in memory and decision-making processes. They suggest that the order in which information is presented can have a significant impact on how it is remembered and how choices are made. The papers provide insights into how the brain processes and stores information, and offer practical applications for designing effective advertising

campaigns, user interfaces, and information systems. The studies suggest that considering the constraints of reading and memory performance can lead to more user-friendly and effective information systems, and that altering the presentation order of choices can be utilized to influence consumer decisions.

## **Implications of Articles**

### **Implication 1:**

Website developers and advertisers can benefit from understanding the serial position effect by strategically placing important information and products at the beginning and end of a page or commercial break.

### **Rationale 1:**

The first article discusses how the serial position effect can be utilized to improve website design and advertising. By understanding that people remember the first and last items on a list more easily, developers can strategically place important information and products at the beginning and end of a page or commercial break, where they are more likely to be noticed and remembered. This strategy has been shown to be effective in increasing attention and recall.

### **Evaluation 1:**

A future study could evaluate the impact of manipulating the serial position of products or information on website performance or advertising effectiveness. For instance, researchers could conduct an experiment where they create two versions of a website or commercial with the same content but different serial positions of the important information or products, and then measure the participants' attention, recall, and choice.

### **Implication 2:**

The visual system adapts to optimize the identification accuracy of alphanumeric stimuli based on the constraints of reading, which can be utilized to develop more effective and user-friendly information systems.

### **Rationale 2:**

The second article shows that the visual system adapts to optimize the identification accuracy of alphanumeric stimuli, such as letters, digits, and symbols, based on the demands of reading. The study found that letters and digits have a first-position advantage over symbols, with higher levels of performance when presented at the beginning of a string. This understanding of how the visual system adapts to optimize the identification accuracy of alphanumeric stimuli can be utilized to develop more effective and user-friendly information systems. For instance, information systems could



present important information or options at the beginning of a list or menu to improve users' identification accuracy and decision-making.

### **Evaluation 2:**

A future study could evaluate the impact of manipulating the serial position of alphanumeric stimuli on users' identification accuracy and decision-making in information systems. For instance, researchers could conduct an experiment where they create two versions of a menu with the same content but different serial positions of the options, and then measure the participants' identification accuracy and choice.

### **Implication 3:**

Serial position effects can impact decision-making even when the optimal choice is not presented last, highlighting the need for careful consideration of presentation order in decision-making contexts.

### **Rationale 3:**

The fourth article shows that the sequence of presenting alternatives can impact individuals' decisions, even when those decisions may not be the optimal ones. The study found that participants were more likely to choose the last option presented, even when it was not the best option. This finding highlights the need for careful consideration of presentation order in decision-making contexts, as the sequence in which choices are presented can impact individuals' decisions.

### **Evaluation 3:**

A future study could evaluate the impact of manipulating the serial position of options on decision-making in different contexts. For instance, researchers could conduct an experiment where they create two versions of a menu or product list with the same content but different serial positions of the options, and then measure the participants' choice and satisfaction. This could provide insights into how serial position effects can be used to nudge individuals towards more desirable choices.

## References

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