Relevancy of The Primary Recency Effect Nick Duratisnky Psychology Honors Hour 4 January 14, 2013 Mr. Tyson Mengel

Abstract

The objective of this experiment was to determine which parts of a list are easiest to remember, and to what extent; it investigated the relevancy of the primary recency effect in a general population. A group of fifteen participants were presented ten, one syllable items for a duration of one second each and were then asked to recite them. The order in which the words were recalled by each participant was recorded. The data based on how many participants recalled each word suggested the words were best remembered in the order they were presented. However, the data based on the average recall order of each word showed that the primary section of the list was most likely to be recalled first, followed by the recency section, with the intermediate section being the least likely to be recalled first. This second set of data agreed with the hypothesis as well as other similar research studies. The data also concurred with the primary recency effect, showing that the first and last portions of a list are more likely to be recalled than the intermediate information.

Introduction

The primary recency effect is a sequential information recollection tendency that is a natural memory characteristic. Primary meaning the first part of the list, and recency meaning the latest or most recent part of the list, have been identified as the easiest and most likely parts of a list to be remembered. This effect is a fundamental memory characteristic of psychology and is prevalent in working memory with both visual and echoic information. The primary recency effect can be seen through the recollection of a list that was within ones attention span, but is more evident through the recollection of information that is beyond this, meaning not all the words were recalled. Memory retrieval in this fashion is also known as the serial position effect, and has been researched through many different forms of studies.

One such study that touches on the primary recency effect was conducted at the University of California, Irvine, which researched if there was any correlation between brain wave mechanisms during the occurrence of the primary recency effect. An fMRI scanner was used during an auditory recollection working memory test to show if there was any relation between the order the information was recalled with activity in a specific brain region. The results revealed that certain parts of the brain are used to recall information that is at the first and last part of a list, whereas other parts of the brain were used to recall the intermediate information. This gives credit to the primary recency effect, through showing that there are physiological mechanisms which result in the occurrence of this trait. (Golob, Starr, 2004)

Another primary recency effect study conducted at Morehouse College was designed to research if this tendency is also relevant in more complicated and lengthy sequences of information. In order to do this, student performance based on the primary recency effect was studied in a classroom setting. This was done through the manipulation of the order in which

information was studied by the students, as well as the order in which the questions were presented on their tests. After evaluating test results based on the manipulation of the aforementioned criteria, the results concluded no connection between test scores and the order of the information. However, the primary information on their tests were found to be stronger than the recent information .This study's results coincide with the notion that the primary recency effect is only prevalent in working memory retrieval, and also suggests primary information is slightly better retained than recency. (Onifade, Jackson, Chang, Thorne, Allen, 2011)

As far as demographics involving the primary recency effect, a study conducted at St. John Fischer College researched the order in which auditory information is recalled by a range of five to eleven year old children. Not only did the results reveal identical primary recency characteristics as adults, the children were able to memorize up to seven items at a time, which is also similar to an adults short-term memory abilities. This study shows that demographics as far as age play essentially no role in the prevalence of the primary recency effect. (Spitzer, 1976)

The purpose of this study was to determine what parts of a list are easiest to remember, and to what extent; it investigated the relevancy of the primary recency effect. The aforementioned studies suggested a definite trend of primary recency memory retrieval, but there were no results which concurred on the order of primary recency and the actual process of memory retrieval. This study was designed to determine this, and the exact order in which sequential information is typically recalled, as well as which parts are commonly forgotten. It was hypothesized that the most primary information would be recalled first, followed by the most recent information, with the majority of parts forgotten in between these areas.

Methods

Participants

The participants of this study were purposefully a diverse group in regards to age (6-75 years old) and consisted of roughly half female (7/15) and half male (8/15) participants. The arrangements for the demographics of this study were based off of Spitzer's study mentioned above, in response to his findings of virtually no correlation between primary recency in relation to age. Since the objective of this test was to determine the relevance of the primary recency effect in the general population, having a testing group of a variety of ages but equal genders would provide the most accurate data for this study.

Procedure

The procedure of this test was designed to be simple for the participants while still providing accurate data. Once a willing test participant was gathered, this script was read to them:

I am a senior from Harborside Academy and this is a test designed to study different short term memory characteristics that we covered in our Psychology class. I will read off a list of ten, single-syllable items and will then ask you to recite them to the best of your ability, the specific order doesn't matter, just try your best to repeat the words in whatever order they come into your mind. Do you have any questions?

This was scripted to assure every variable in the experiment was consistent for each test. The test participant was then asked if they are ready for the list, and with their confirmation, the list "Dog, Flag, Shoe, Chair, Car, Duck, Pen, Ball, Book, Phone" was read in this exact order, with a one second pause being left between each word. One syllable words were chosen so that the test participant would have an easier time recalling the items on the list. The test participant was then asked "What words were on the list I just read?". As the test participant recalled the words from the list, the order the words were recalled were kept track of through use of numbering them on a

chart. After the test participant recited all the words they could remember, they were dismissed. This process was then repeated for a total of fifteen test participants.

Scoring

The scoring of the test participants results was based off of not only what words were recalled, but also the order in which they were recited. The relevancy of the primary recency for each participants results was determined through whether the order of the words recalled followed the order of primacy and recency, meaning the first and last group of words were recalled first and more often than the words in the middle of the list. To simplify this process, the first and last three words on the list were considered the primary and recency part of the list, and the four words in-between were considered the middle of the list. The relevancy of primary recency was quantified for each participant based on whether a larger percentage of words were recalled in the first, middle, or last part of the list.

	Fig 1: Ordered Word Responses From Test Participants														
	Test Participant														
Word	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14	T15
Dog	3	1	1	1	1	1	1	1	1	-	1	1	1	1	1
Flag	-	2	2	2	2	2	3	2	2	2	2	2	2	2	2
Shoe	-	5	3	6	3	3	2	3	5	-	3	-	-	3	-
Chair	-	-	-	5	5	4	-	-	6	3	4	3	-	-	4
Car	-	-	6	4	-	7	-	7	-	5	6	4	5	5	5
Duck	-	6	5	-	6	5	-	6	7	4	-	6	-	6	6
Pen	-	-	-	-	-	-	-	-	-	-	-	-	-	7	-
Ball	2	-	-	-	-	6	-	-	-	-	-	-	-	-	-
Book	4	3	4	3	4	-	4	4	3	6	-	-	4	-	-
Phone	1	4	-	-	-	-	-	5	4	1	5	5	3	4	3
*(-) repr	esent	ts mis	sed v	vords.	Numb	ers rep	presen	t order	in wh	ich wor	rds wer	e recall	ed. Wo	rds were	•
presente	l in t	he ord	ler lis	sted go	oing de	own th	e colu	mn lab	eled r	ow. Blu	le rows	represe	ent prim	narv part	of

Results

Fig 2: Amount of People Who Fig 3: Average Amount of People Who **Recalled Each Word Recalled Words Per Section of List** 15 15 Amount of People Amount of People 10 10 5 5 0 Phone Dog Flag Duck Pen Shoe Chair Car Ball Book 0 Primary Intermediate Recency Word Recalled Section of List

the list, red represents the intermediate part of the list, and green represents the recency part of the list.

* For Fig 4 and 5: An order recall of 1 indicates that on average, that word was recalled first by each participant. The lower the number, the sooner the word was recalled.



Discussion

The resulting data of this study provides two separate sets of information. One being the amount of people who recalled each word, along with the average order each word was recalled. When looking at just the amount of people who recalled each word, the data suggests that the participants had an easier time remembering the words in the order they were listed. Meaning, the primary part of the list had the most amount of recalled words, followed by the intermediate part of the list, and ending with the least amount of words recalled in the recency section of the list. When averaged out, the amount of words recalled had a steady, linear decline beginning at the primary section of the list. This set of data does not concur with the primary recency effect, the hypothesis of this experiment, or any of the similar aforementioned research studies.

However, when taking into account the average order each word was recalled, the data is much more conclusive. Beginning with the first word "dog" on the list, it was on average the first word recalled by each participant. The next word "flag" was, on average, the second word recalled by each participant. There was a similar pattern of increase in the order of word recall up until the word "pen" which was located at the end of the intermediate section of the list. The word "pen" was the last word recited on average, with an average recall order of 7. There was then a significant drop in order recall for the word "ball", which was located at the first part of the recency section of the list, with an average recall order of 4. From this point there was a steady but slight decline in average recall order, ending with an average of 3.5 for the last word "phone".

When the average order each word was recalled is averaged over each section of the list, the results in regards to the primacy and recency effect become clear. Words in the primary part of the list were generally recalled first with an average recall order of 2.25, followed by the

recency part of the list with an average recall order of 3.75, and ending with the intermediate part of the list with an average recall order of 5.5. This concurs with the primary recency effect, suggesting that people are better able to recall words in the primary (61% chance of being first word recited) and recency sections of a list (34% chance of being first word recited), compared to the intermediate section (5% chance of being first word recited). This also agrees with the hypothesis of this study, showing that the primary information was recalled first, followed by the most recent information, with the intermediate section being recalled last. Onifade's study mentioned in the introduction suggested that primacy information were slightly easier to recall than recency, and the results of this study also produced the same conclusion.

Some errors in this experiment that could have affected the data were the inconsistencies that are accompanied by the presentation of the list to the test participants. Although it was timed, some may have received slightly more time between word spaces, or the words may have been spoken slower/faster with some participants and also possibly less clear. To eliminate these variables, it would have been best to use a prerecorded voice of the list being presented. This way the list would have been presented the same exact way for each test participant, giving the test more consistency.

Conclusion

The purpose of this study was to determine what parts of a list are easiest to remember and to what extent; it investigated the relevancy of the primary recency effect. A group of 15 test participants were presented 15, one syllable items for a duration of one second each, and were then asked to recite them. The order in which the words were recalled by each participant was recorded. The data based on how many participants recalled each word showed a slightly negative linear trend, beginning with the first word on the list, and suggested the words were best

remembered in the order they were presented. The data based on the average recall order of each word showed that the primary portion of the list was most likely to be recalled first (average recall order of 2.25), followed by the recency section (average recall order of 3.75), with the intermediate section being the least likely to be recalled first (average recall order of 5.5). This second set of data agrees with the hypothesis as well as other similar research studies. This also concurs with the primary recency effect, showing that the first and last portions of a list are more likely to be recalled than the intermediate information.

The results, analysis, and conclusions of this study revealed several possible methods for future research on the primary recency effect. One possible option for further investigation would be to simply include a larger sampling group of participants in order to provide a larger, more accurate set of data. Also, the primary recency effect appears to be evident in short-term auditory memory recall, but it would be interesting to compare these results to a similar study based on visual memory recall. The relevancy of the primary recency effect for visual memory could then be compared to auditory memory to determine if the patterns of sequential information recollection are particular to one form of memory over the other.

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