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## Testing the Production Effect in Memory for Words

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# Testing the Production Effect in Memory for Words

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## Abstract

Previous research on the production effect shows that reading words aloud improves people's memory for those words compared to words read silently. The purpose of our study was to extend this research to see if reading words aloud would improve people's memory compared to hearing someone else say the words aloud. We also wanted to see if the production effect depends on the type of words (abstract or concrete words) and the type of memory test (recall or recognition). Participants were shown 30 words, one at a time, with each word presented for 4 seconds on a PowerPoint slide. Half of the words were abstract words (such as *value* and *reason*) and the other half were concrete words (such as *table* and *paper*). One group was instructed to read each word aloud as it appeared on the screen. A second group was instructed to read each word silently as it appeared. In the third group, as each word appeared on the screen, participants heard an audio recording of the word spoken aloud by one of the researchers. After all 30 words were presented, the participants were asked to recall the words by writing down as many as they could remember. Next, they completed a recognition memory test in which they given a sheet containing the 30 presented words mixed together with 30 words that were not presented in the PowerPoint. They were asked to circle the words that they remembered being presented earlier. We then compared participants' memory performance to see if there were any significant differences among the groups, and whether the differences depended on the type of words or the type of memory test used.

## Introduction

Production effect is when an individual favors to read aloud, rather than silently pertaining to the difference in memory. Aloud words relative to silent words shows distinctiveness of whether the word has been encoded into memory. One common method of studying production effect was made by MacLeod & Bodner (2017). They had participants read aloud and silently, measuring between recognition of the word, compared to being able to recall the words via writing.

The purpose of present research was to test whether reading out loud is the better method for recalling words compared to hearing a recording and reading silently.

We hypothesize that participants in the reading aloud group would have a higher number of words recalled and recognition than participants in the reading silently group and listening to recording group. We also predicted that participants will recall more concrete than abstract words.

## Method

### Participants

- Total of 45 (30 women, 14 men, and 1 unidentified) participants whom are CSB/SJU students
- Age range 18-22
- We had 29 Asian, 2 African American, 8 Caucasian, 6 Hispanic.
- We had 5 first years, 16 second year, 19 third year, and 5 fourth year.

### Materials and Procedure

- We used two list of 15 words taken from Toronto Noun Pool.
- One list contained words that were rated as concrete and the other list contained words that were rated as abstract.
- The two lists were matched on word frequency.

#### Concrete Words (15 words):

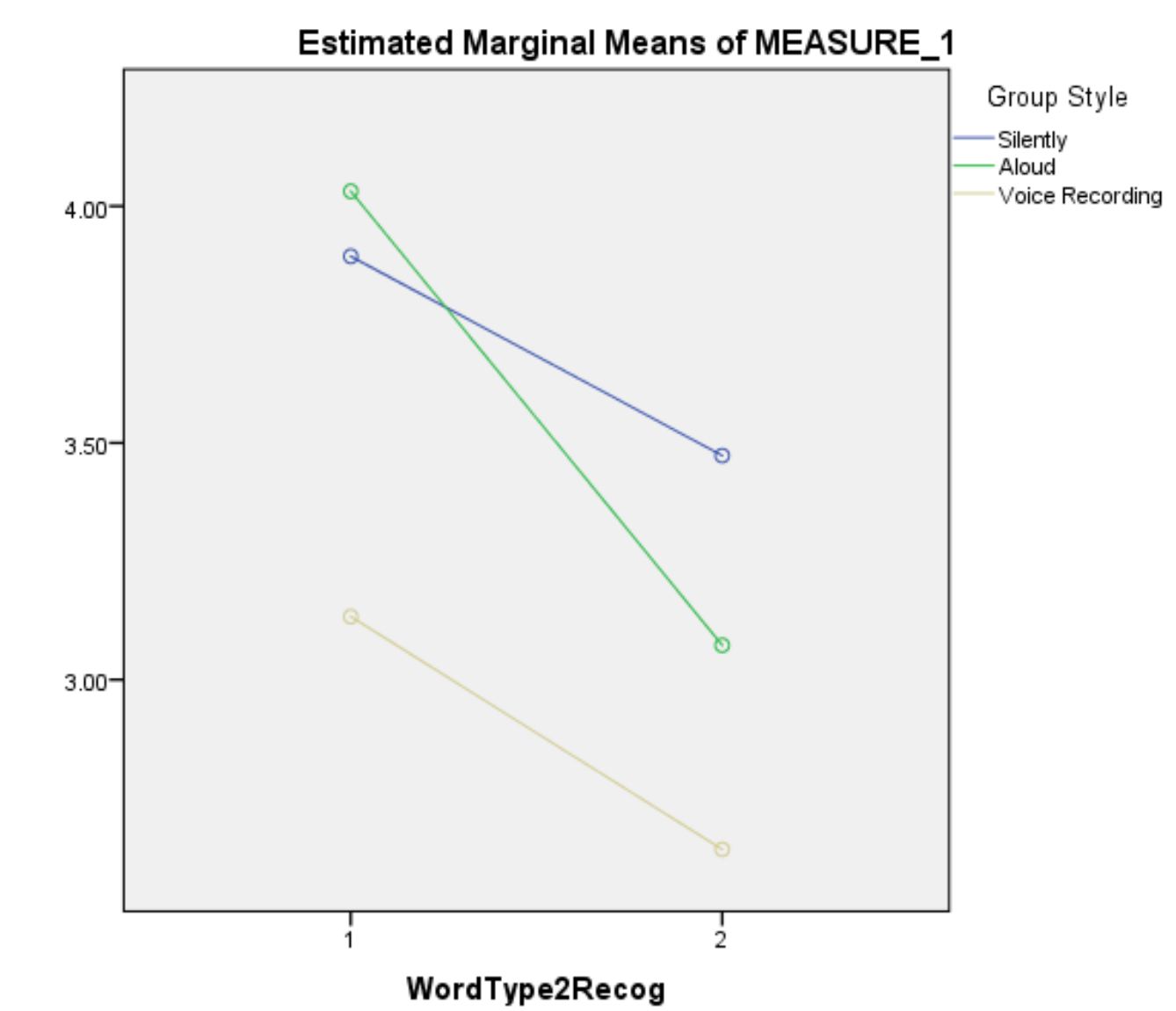
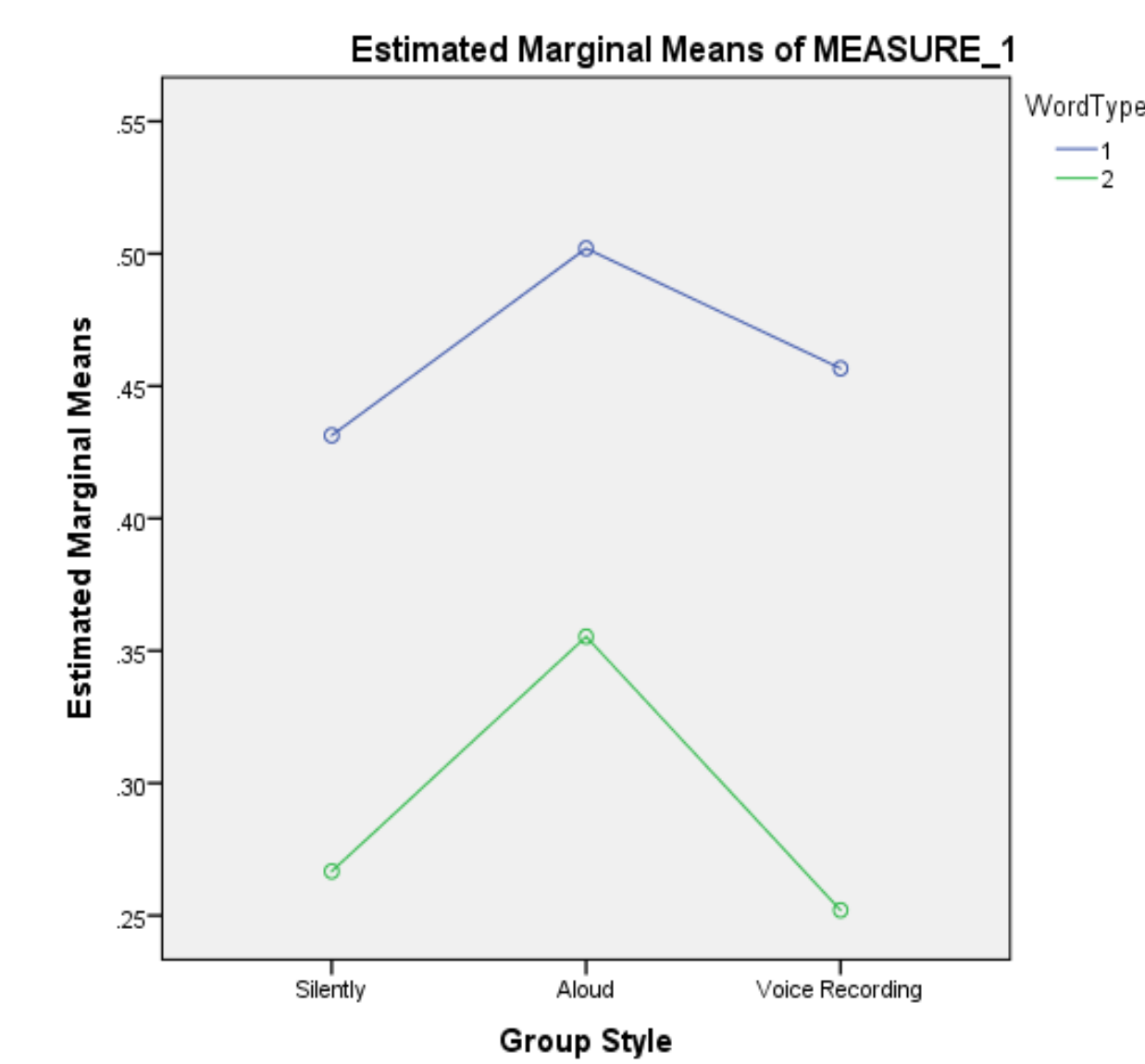
1. Business
2. Culture
3. Music
4. Image
5. Party
6. College
7. Body
8. City
9. Women
10. Silence
11. Table
12. Paper
13. Mother
14. Letter
15. Market

#### Abstract Words (15 words):

1. Degree
2. Nothing
3. Interest
4. Value
5. Being
6. Effect
7. Basis
8. Trouble
9. Reason
10. Standard
11. Justice
12. Theory
13. Merit
14. Aspect
15. Notion

- Every participant was presented with words on a PowerPoint, with one word per slide for 4 seconds.
- One group was instructed *to read each word aloud* as it appeared on the screen. A second group was instructed *to read each word silently* as it appeared. In the third group, as each word appeared on the screen, participants *heard an audio recording* of the word spoken aloud by one of the researchers.
- After the PowerPoint was presented, the participant were given two minutes to write down as many words as they could recall from the PowerPoint.
- Afterwards, the participants are handed a list of words (word recognition test) and given two minutes to circle the words presented on the PowerPoint. The sheets contained 30 words from the PowerPoint and 30 other words.

## Results



A 2 x 3 mixed ANOVA was conducted to test the effects of group and word type on free recall. There was a marginally significant main effect for group,  $F(2,42) = 3.13, p = .054$ . Post hoc comparisons showed that the *aloud* group recalled significantly more words than both other groups. There was also a significant main effect for word type, with concrete words recalled significantly more than abstract words,  $F(1,42) = 32.64, p < .001$ . See the graph on the left for the mean recall proportion in each condition.

Another 2 x 3 mixed ANOVA was conducted to test the effects of group and word type on recognition memory, using  $d'$  as a measure of sensitivity. There was no significant main effect for group, but there was a significant main effect for word type, with concrete words recognized significantly more accurately than abstract words,  $F(1,42) = 14.66, p < .001$ . See the graph on the right for the mean  $d'$  scores in each condition.

## Discussion

As predicted there was a significantly higher percentage of concrete words being recalled compared to abstract words in both recall and recognition test.

If further research was conducted we would gather more participants that would represent the bigger population along with using different words.

## References

- MacLeod, C. M., & Bodner, G. E. (2017). The production effect in memory. *Current Directions in Psychological Science, 26*(4), 390-395.
- MacLeod, C. M., & Kampe, K. E. (1996). Word frequency effects on recall, recognition, and word fragment completion tests. *Journal of Experimental Psychology: Learning, Memory and Cognition, 22*(1), 132-142.