

# Biased Information Encoding Influences Both Gist and Verbatim Post-Decision Memory for Attribute Information

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## INTRODUCTION

- Making a choice biases memory for the options (Lind et al., 2017), sometimes because of post-choice bolstering of the chosen option (Mather et al., 2000).
- DeKay et al. (2014) found that pre-choice ratings of attribute information predict post-choice memory biases for that information.
  - This result held even when controlling for the chosen option.
  - But their studies assessed recognition memory only.

**Goal:** Extend DeKay et al.'s findings to two additional tasks: gist and verbatim recall of attributes information.

## TWO NEW STUDIES

- Study 1 ( $N=506$  MTurk workers) had 6 binary decisions with 5-8 attributes each.
- Study 2 ( $N=271$  MTurk workers) had 2 binary decisions with 20 attributes each. This study was pre-registered.

## METHODS

- Participants in the choice condition viewed information sequentially and evaluated the appeal of each attribute (as shown below) before making a final choice.
  - After making all choices, they answered the memory questions described in the next panel.
  - Study 1 participants answered memory questions only for their last decision.

## Independent Variable

- Pre-choice information ratings: Corrected for the means from a no-choice control condition.
  - Higher values indicate that the information favored Option B (the second option).

The screenshot shows a choice task interface. At the top, it says "The Alameda gets an estimated 33 MPG for city driving" and "The Callisto gets an estimated 28 MPG for city driving". Below this, it asks "Based only on the information on this page, how appealing or unappealing are these features of these cars?". There are two columns of attributes: "Very Unappealing" and "Very Appealing". Under "Very Unappealing", there are radio buttons for "Alameda" and "Callisto" for each attribute. Under "Very Appealing", there are radio buttons for "Alameda" and "Callisto" for each attribute. At the bottom, there are two buttons: "Choose Alameda" and "Choose Callisto".

## Dependent Variables

There were two memory tests.

### Gist Memory

- Participants recalled which option had the higher or larger number for each attribute.
- Higher scores indicate that attribute memory favored Option B.

### Verbatim Memory

- Participants recalled the exact values for each numerical attribute.
- Higher scores indicate that verbatim memory favored Option B or disfavored Option A.
  - We controlled for true attribute values.
  - Because different attributes had larger or smaller numbers, we used natural logs.
  - Verbatim Memory =  $\ln(\text{Option B}) - \ln(\text{Option A})$

### Gist

The screenshot shows a gist memory test interface. It asks "For the next few questions, you will be asked to recall some of the information you viewed earlier. Specifically, you will be asked which of the two cars had a higher or larger number for each attribute and (in general terms) how big the difference between the two cars was." Below this, there is a table with columns for "Alameda" and "Callisto" and rows for "Which car had more horsepower?", "Which car had more leg room for rear seat passengers?", "Which car had a higher price?", and "Which car had a higher sales price?". Each cell contains a radio button.

### Verbatim

The screenshot shows a verbatim memory test interface. It asks "In the next few questions, you will again be asked to recall some of the information you viewed earlier. This time, we would like you to recall (as well as you can) the specific numbers associated with each car." Below this, there is a table with columns for "Alameda" and "Callisto" and rows for "What was the price of each car?", "What percentage of the value was each car projected to retain in 5 years?", "What model year was each car?", and "How many cubic feet of trunk space did each car have?". Each cell contains an input field.

## RESULTS (for both studies combined)

### Gist Memory

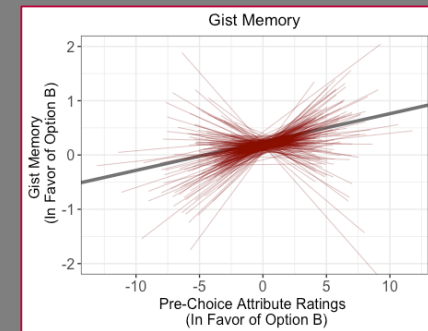
- Pre-choice attribute ratings predicted which option was recalled as being better on each attribute ( $b = 0.05, p = .008$ ).
- The figure is based on a mixed-effects regression which controlled for (a) participants' final choices and (b) the true directions of the attributes.
- The lines show positive slopes for most participants.

## BIBLIOGRAPHY

DeKay, M. L., Miller, S. A., Schley, D. R., & Erford, B. M. (2014). Proleander and antitrailer information distortion and their effects on choice and postchoice memory. *Organizational Behavior and Human Decision Processes*, 125(2), 134-150.

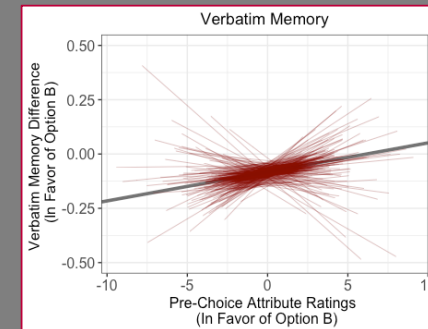
Lind, M., Visentini, M., Mäntylä, T., & Del Missier, F. (2017). Choice-supportive misremembering: A new taxonomy and review. *Frontiers in psychology*, 8, 2032.

Mather, M., & Johnson, M. K. (2000). Choice-supportive source monitoring: Do our decisions seem better to us as we age?. *Psychology and aging*, 15(4), 596-606.



### Verbatim Memory

- Pre-choice attribute ratings predicted corresponding memory differences for the numerical attribute values ( $b = 0.13, p = .009$ ).
  - This models also controlled for (a) participants' final choices and (b) the true numerical values of the attributes.
- For the verbatim results, participants' final choices did not predict verbatim memory differences ( $b = 0.01, p = .73$ ).



## CONCLUSIONS

- Post-choice memory for the attributes of choice options seems to depend on the pre-choice encoding of that information.
- Memory biases do not reflect only post-choice bolstering of the chosen option.
- To our knowledge, current theories of memory do not account for the reported effect of pre-choice encoding.