# Effects of Self-Perception and False Feedback on Short-Term Memory Performance

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## Introduction

- Previous research has shown that short-term memory can be manipulated by various factors, including what type of mood a person is in (positive vs. negative mood), whether or not a person is fatigued, and also whether or not a gift was given to the person before or after the measurement task.
- Letter-span tasks are used as a means to measure short-term memory in many different fields of psychology research such as cognitive, developmental, clinical, and educational.
- This research project aimed to investigate the role feedback and self-perception play pertaining to short-term memory performance and to investigate the stability of letter-span tasks.

## Method

- Fifty-five subjects (44 female, 11 male) were recruited from the IUPUC campus as well as the Ivy Tech Columbus campus.
- Mean age was 24.4 (8.2)
- Study was conducted on computers in the Psychology Lab with E-Prime 2.0 software and was completed in the following order:
  - Simple letter span test (pre-test)
  - Measured self-perception
  - Randomly assigned to false feedback group (positive, negative, or none)
    - Feedback was both visual and audible
  - Simple letter span test (post-test)
  - Debriefed subjects

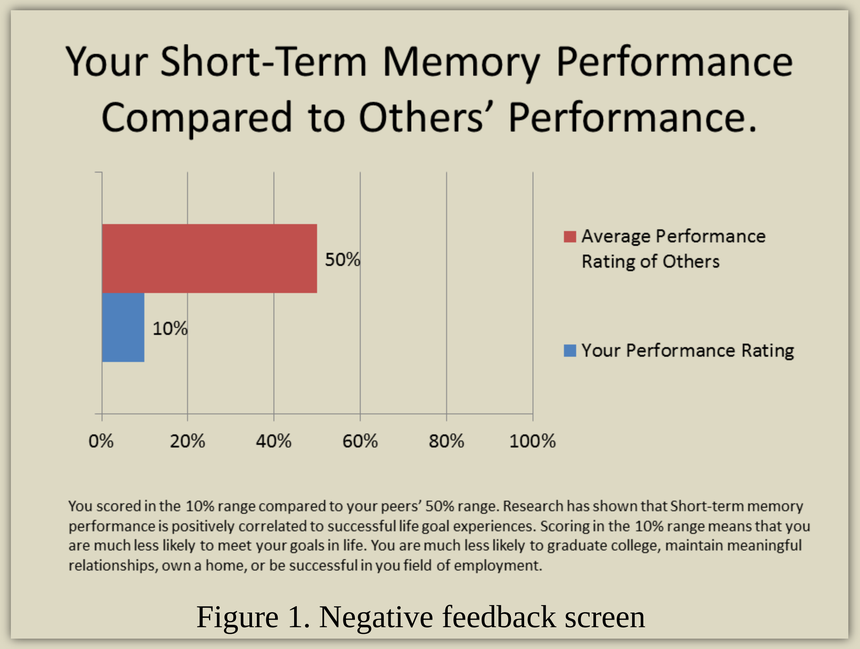


Figure 1. Negative feedback screen

## Results

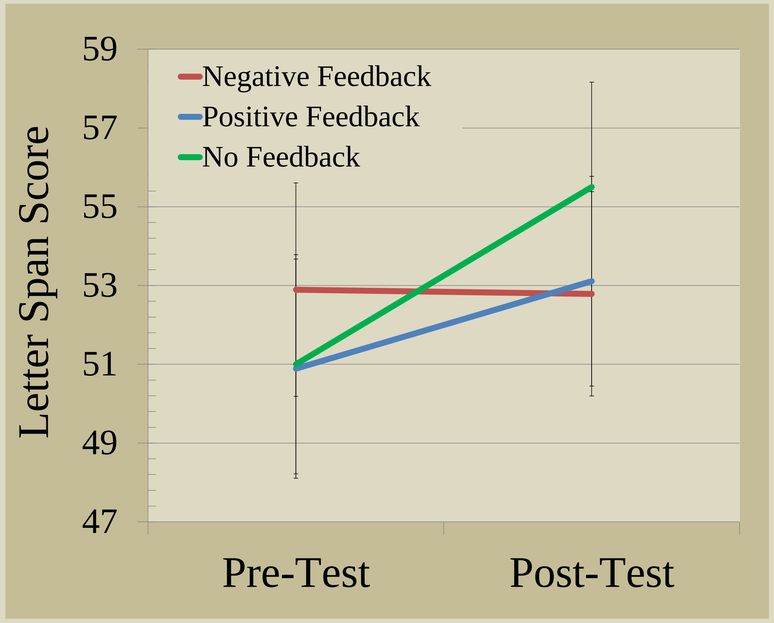


Figure 2. Letter Span Scores at Pre-Test and Post-Test as a Function of Feedback Condition

**ANOVA**

- Main effect of Time was marginally significant: $F(1,52) = 3.80$, $p = .06$, $\eta_p^2 = .07$
- Main effect of Feedback was not significant: $F(2,52) = 0.06$, $p = .94$, $\eta_p^2 < .01$
- Interaction of Feedback and Time was not significant: $F(2,52) = 1.40$, $p = .26$, $\eta_p^2 = .05$

**Follow-up Analyses**

- The No Feedback group increased Letter Span scores significantly between Pre & Post-Test: $t(17) = -2.22$, $p = .04$
- Changes in Positive or Negative Feedback groups' Letter Span scores were not significant:
  - Positive group: $t(17) = -1.06$, $p = .30$
  - Negative group: $t(18) = 0.06$, $p = .95$
- Pre-test scores did not differ between the groups: $F(2, 52) = 0.17$, $p = .84$

**Correlation**

- Subjects' pre-test scores and their self-perception were positively correlated, $r(53) = .40$, $p < .01$

## Discussion

- Any kind of feedback, positive or negative, appears to eliminate the practice effect and hinder short-term memory performance.
- The No Feedback group experienced a significant improvement between pre-test and post-test.
- The improvement was caused by more gain from pre-test to post-test on longer letter spans (set size 6-9) than the other two groups.
- Results do not support the idea that negative feedback significantly hinders short-term memory performance worse than no feedback or positive feedback.
- Substantial variability in amount of change between pre-test and post-test in feedback conditions suggests individual differences (e.g., personality, cognitive control, meta-cognition) play a role as to whether or not feedback affects an individual's short-term memory.

## Future Directions

- Measure subjects' personality type before pre-test
- Use less intense false feedback, such as 'below average' or 'above average' instead of a percentage range
- Use truthful positive and negative feedback during test performance

## Conclusion

- Letter Span tests are frequently used to assess short-term memory functioning in pre/post research designs (e.g., educational, pharmaceutical, and cognitive training interventions).
- The use of positive or negative feedback may alter subsequent test performance and complicate the interpretation of change scores.

## Acknowledgements

- This research was funded by an award from the IUPUC Office of Student Research.
- An electronic copy of this poster is available for download from Dr. Tom Redick's IUPUC Applied Cognition Lab website:

http://mypage.iu.edu/~tsredick