

Goal

To examine the effects of feedback in an online math learning environment. In particular, to compare self-directed feedback, task-directed feedback, and no- feedback.

Background

Feedback is a ubiquitous learning tool, but it can have positive or negative effects (e.g., Fyfe & Rittle-Johnson, 2016). One theory suggests that feedback is likely to have negative effects when it directs attention to the self (e.g., I must not be smart) as opposed to the task (e.g., oh, that's how you solve the task) (Kluger & DeNisi, 1998).

Method & Predictions

Undergraduate students participated in a single online learning session. They solved a set of five probability problems and received one of three types of feedback after each problem: Self-Feedback, Task-Feedback, or No-Feedback. Then, students completed a 5-item posttest.

We expected students in the task-feedback condition to score higher on the posttest than students in the no-feedback condition. In contrast, we expected students in the self-feedback condition to score the lowest.

Experiment Materials

Target Problem

Problem #1
Problem Scenario: Breathalyzers

Imagine you work in a police department. Your department often uses Breathalyzers to test whether drivers are driving under the influence of alcohol. You test a driver and the Breathalyzer test indicates that he is drunk. Based on previous cases in which a person's sobriety was later verified, you know the following:

	Positive Breathalyzer Test (Indicates drunkenness)	Negative Breathalyzer Test (Does not indicate drunkenness)
Sober Driver	A 250	B 5500
Drunk Driver	C 1000	D 150

Based on this table, how likely is it that a driver with a positive Breathalyzer test is actually drunk?

0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1

Slide the bar along the scale to select an answer. 0.25

Posttest Problem

Problem #3
Problem Scenario: Blood tests

Imagine you are a doctor. You often use blood cultures to determine if patients have bacteria in their bloodstream. Your patient just received a positive blood culture test. Based on previous cases in which the patients' health was later verified, you know the following:

	Positive Blood Culture (Indicates bacteria)	Negative Blood Culture (Does not indicate bacteria)
Blood Contains Streptococci Bacteria	A 775	B 225
Blood Contains Meningococcal Bacteria	C 400	D 200
Blood Contains Legionella Bacteria	E 325	F 75
Blood Contains No Bacteria	G 1500	H 6500

1. Based on this table, how likely is it that blood contains bacteria?

0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1

Slide the bar along the scale to select an answer.

Condition Differences in Feedback and Advancing Questions

Self-Feedback

- Correct trials: **YOU got it! Your response is correct! You responded with 80%.**
- Incorrect trials: **YOU made a mistake. Your response is incorrect. You should have responded with 80%.**

Task-Feedback

- Correct trials: **The response provided is correct. The correct response is 80%.**
- Incorrect trials: **The response provided is incorrect. The correct response is 80%.**

No-Feedback

- Correct and incorrect trials: **The response has been recorded.**

Did you answer the question correctly or incorrectly?

- I did not answer the question correctly
- I answered the question correctly

Which was the correct response?

- 60%
- 80%

Are you ready to move to the next problem?

- Yes
- No

Intersections with Technology

We programmed the experiment in a Qualtrics survey and administered the experiment to undergraduate psychology students via SONA. Utilizing an online learning environment allowed for greater control over aspects of the learning environment (e.g., timing, administration of feedback, item order, etc.) and removed any effects of the social, person-to-person feedback administration.