

You may work with one partner on this assignment, submitting one report with both names, provided that both students contribute substantially to the work. Word-processed reports are preferred to hand-written ones. Please copy/paste relevant computer output into your report as appropriate.

Praising Intelligence or Effort?

Psychologists investigated whether praising a child's intelligence, rather than praising his/her effort, tends to negative consequences such as undermining their motivation (Mueller and Dweck, 1998). Children participating in the study were given a set of problems to solve. After the first set of problems, half of the children were randomly assigned to be praised for their intelligence, while the other half was praised for their effort. The children were then given another set of problems to solve and later told how many they got right. They were then asked to write a report about the problems for other children to read, including information about how many they got right. Some of the children misrepresented (i.e., lied about) how many they got right, as shown in the following table:

	Praised for intelligence	Praised for effort	Total
Misrepresented their score (lied)	11	4	15
Did not misrepresent (did not lie)	18	26	44
Total	29	30	59

a) For each group, determine the proportion who lied.

Intelligence: $11/29 \approx .379$

Effort: $4/30 \approx .133$

b) Do these proportions differ in the direction conjectured by the psychologists (as indicated in the first sentence above)? Explain.

Yes, the higher proportion of negative behavior (lying) occurs in the group that was praised for intelligence, not for effort.

c) Describe how you could use index cards to conduct a simulation analysis for determining whether the difference between these proportions is statistically significant. Include the following information in your description:

- i) how many cards you would use
- ii) how many would be marked how
- iii) how many you would deal out
- iv) which kinds of cards you would count
- v) what you would compare the results to, after you conducted a large number of repetitions

You would need 59 cards, one for each child. Mark 15 of the cards to represent the ones who lied, and mark the other 44 to represent the ones who did not lie. Shuffle up the cards and deal out 29 for the "intelligence" group and the other 30 for the "effort" group. Count how many of

the cards marked as lying children are in the “intelligence” group. After repeating this process a large number of times, see how unusual it is to have 11 or more of the lying children/cards in the “intelligence” group.

d) Describe the null model underlying your simulation analysis.

The null model is that the type of praise does not affect how likely a child is to lie.

It can be shown that the p-value for this study is .0298.

e) Provide a complete, detailed interpretation (in one or two sentences) of what this p-value measures in this context (i.e., what is its probability of?)

The probability is about .03 that random assignment alone would produce lying proportions as different as those in this study (.379 vs. .133), if in fact there were no difference between the two types of praise with regard to how likely a child is to lie.

f) Based on this p-value, is the observed difference between the groups statistically significant at the $\alpha = .05$ level? Explain how you know.

Yes, because the p-value is less than .05.

g) Summarize your conclusion. Be sure to address whether it's valid to draw a cause-and-effect conclusion between the communication medium and lying about the size of the pot in this bargaining game.

The experimental data provide fairly strong evidence that praise for intelligence does cause children to lie more often than does praise for effort. The fairly strong evidence comes from the fairly small p-value, which indicates that a result as extreme as the one observed would be unlikely to occur by chance alone. The cause/effect conclusion is warranted partly because of the small p-value but also because this was a randomized experiment, not an observational study.