**Lineups Activity**

**Building Intuition for Two-Sample Inference**

The goal of this activity is to develop your intuition about the logic of hypothesis tests using a visual lineup test.

**BACKGROUND**Evidence suggests that reward systems may operate in the opposite way from what is intended (e.g., ranking systems may decrease productivity; grading systems may not stimulate learning). To investigate this phenomenon, Amabile, T. M. (1985) designed a study to explore whether motivation type (intrinsic or extrinsic) impacted creativity scores. In this study, 47 creative writers were randomly assigned to one of two questionnaires where they ranked reasons they write. One questionnaire listed intrinsic motivations and the other listed extrinsic motivations. After completing the questionnaire, all subjects wrote a Haiku about laughter, which was graded for creativity by a panel of poets. The average rating (out of 40 points) for each subject was recorded.

In this activity, you will explore whether there are discernible differences in creativity between the two groups.

**GROUP QUESTIONS**

1. Is this an experimental or observational study? How do you know?
2. What research question is being investigated? That is, what is the objective of this study?
3. Write down the competing claims (i.e., hypotheses) being investigated.
4. Identify the response and explanatory variables.
5. What type of plot could you use to compare the two treatment groups? Why did you choose this plot type? How does this plot help you investigate the competing claims?

**INDIVIDUAL QUESTIONS** *Please do not discuss your answers with your group until you start question #8.*

Below is a lineup of plots where one plot displays the observed data and the other 19 plots are “decoy” plots where there is no difference between the treatment groups.

1. Which plot do you think is the most different from the others?
2. What feature(s) of the plot led you to this choice?



**GROUP QUESTIONS**

1. Which plot does your group think is the most different from the others?
2. What feature(s) of the plot led you to this choice?

***STOP HERE!*** *We will have a large group discussion sharing the results and then the plot that displays the observed data will be revealed.*

The observed data are in plot # \_\_\_\_\_\_.

1. Did your group choose the observed (data) plot?
2. Based on your answer to question 10, what does this suggest about your competing claims?