Shapesplosion Lab

**Background:**

The following pages provide guided steps for conducting your own research project involving an online game. You will design your own study, collect data, analyze the results, draw conclusions, and present your results.

When the author of this lab sat down with her 5-year-old son to teach him how to tie his shoes, she was surprised that she couldn’t tell him how to do it. Even though she tied her own and her children’s shoes almost every day, she had to tie the shoe herself and watch each step before she could break down the steps in order to teach her son. This is just one example of automatized behaviors, which are behaviors that can be done automatically without carefully thinking through each step in the process.¹

The Stroop effect demonstrates that automatized behaviors can interfere with other desired behaviors. John Stroop tested the reaction time of college undergraduates in identifying colors. Students took a longer time identifying colors of ink when the ink was used to spell a different color. For example, if the word “red” was printed in blue ink, students took longer to identify the color blue because they automatically read the word “red.” Even though students were told only to identify the ink color, the automatized behavior of reading interfered with the task and slowed their reaction time.

Go to the web site: [http://kuiper.pearsoncmg.com/shapesplosion/](http://kuiper.pearsoncmg.com/shapesplosion/) and play the Shapesplosion game using the following two sets of directions:

- **Game Length?**: Intermediate
- **Match Proximity**: Medium
- **Number of Shapes**: 15
- **Matching Scheme**: Shape, all same color
- **Show Timer**: Yes
- **Store in Database**: Yes
- **Check the Participant Info box**
  - Participant ID: use a secret name, any combination of letters and numbers with no spaces. Do not use a name or term that will allow others to identify you.
  - Group ID: provided by your instructor, such as Stat101A or UnivNY1

- **Game Length?**: Short
- **Match Proximity**: Medium
- **Number of Shapes**: 24
- **Matching Scheme**: Shape, different colors
- **Show Timer**: Yes
- **Store in Database**: Yes
- **Check the Participant Info box**
  - Participant ID: use the same Participant ID for all games that you play
  - Group ID: provided by your instructor, such as Stat101A or UnivNY1

¹ Note that many psychologists would call this procedural knowledge instead of automatized behavior. Both are processes that can be done without conscious thought, but automatized behaviors are processes that cannot be slowed down, do not decline with age, and show no gender differences.
Conduct a hypothesis test about students in your class. As a class, develop a research hypothesis comparing conditions that may have an impact on the game completion time.

1. State the null and alternative hypotheses corresponding to the objective of this study.

2. All students in the class should play the game(s) for your study. Determine the settings for each of the following variables:
   - Game Length?
   - Match Proximity
   - Number of Shapes
   - Matching Scheme
   - Show Timer
   - Group ID

3. Identify the response variable, explanatory variable, and units. How many games will each student play?

4. List any other conditions that should be controlled during this study.

5. Why is it important to attempt to ensure that all subjects play the game under the same conditions?

6. After all students complete the games, use the Recorded Data button to view all data from your course (use same Group ID as above). Copy and paste the data into Minitab, Excel, or other statistical software package. Create a histogram and box plot of your data. Are there any outliers or skewness shown in your plots? Are there any errors in the data? Correct or delete the erroneous data.

7. Use a paired t-test or a two-sample t-test (or other technique) to evaluate your hypotheses. Calculate an appropriate p-value for your study.

8. What assumptions need to be checked before you can conclude the analyses in Question 7) is appropriate?

9. State your conclusions in context. For example, be sure to explain whether you can use this data to conclude that your results hold for all students at your school. Explain whether this is an observational study or an experiment.