

Module 1: Introduction to Psychology

Authentic Assessment: Stroop Effect Scientific Investigation

Before you begin the scientific investigation below, make sure to download the Stroop Effect Scientific Investigation Report. As you complete this scientific investigation, fill in any needed information on the report template. If you need more information about each section of the report, please visit the Developmental Module.

Introduction

Psychology is a discipline that utilizes a variety of methods and approaches to better understand behaviors and thoughts. Although some perspectives and approaches within psychology are less scientific in outlook than others, all approaches to psychology attempt to be objective in describing human—and occasionally, animal—patterns of thought and behavior. You engage in a very informal type of psychology whenever you try to predict other people's behavior or guess what they might be thinking. For most common experiences, a knowledge of psychology might help you better understand others, but you would rarely need to conduct extensive research for these kinds of decisions.

Beyond personal, everyday interactions, companies and governments often want to be able to predict or even change people's behavior or ideas. If a supermarket changes how it advertises its discounts, will that lead to higher sales of those items? If a law is passed to restrict the number of passengers a teen driver can have, will fewer accidents really result? Investigating the answers to the psychological aspects of these questions is not easy, and common-sense answers are not sufficient. How can those engaged in psychological research be certain that their conclusions about other people are not just a reflection of their own personal biases, beliefs, or judgments? To truly establish cause-and-effect relationships, only a scientific experiment will suffice.

The Stroop Effect: A Psychological Investigation

Do you think you can easily identify colors? If you were to show a color to a test subject, would that person be able to tell you the name of the color? It may seem like an easy task, but what if the test subject must tell you the name of a color that is used to spell out the name of another color? Would the spelling of the word distract and confuse the test subject?

Try this task yourself using the example below. First, look at the list of words below and say aloud the color of each word. Be sure not to skip any items, and do not move forward to the next item until you have correctly said the color of the item aloud. About how long does it take you to identify the colors?

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Matching Set of Words

orange	blue	red	black	yellow
purple	black	yellow	orange	blue
red	green	blue	red	black
yellow	blue	purple	green	orange
green	orange	black	yellow	purple

Now look at the second list of words below and say aloud the color of each word, not the written word. Be sure not to skip any items, and do not move forward to the next item until you have correctly said the color of the item aloud. Do you think this set of colors will take you longer to complete?

Non-Matching Set of Words

blue	green	red	orange	purple
black	yellow	orange	blue	yellow
red	black	purple	green	red
green	orange	black	blue	yellow
red	green	blue	purple	orange

Most people find that task involving the second set of words is surprisingly difficult. This feeling of struggling to name the color of the word instead of simply reading the text of the written word is called the Stroop Effect. In the following investigation, you will measure the Stroop Effect in several test subjects as a means of familiarizing yourself with the scientific method.

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Objectives

In this scientific investigation, you will:

- observe and measure a classic psychological phenomenon, the Stroop Effect; and
- reflect on some of the challenges of carrying out psychological research.

Hypothesis

Using the **Procedure and Data Collection** section, read through the procedural information for this scientific investigation. Based on your understanding of the procedure, develop your own hypotheses, which describe your expected results. You should consider the following question: How much can text color interfere with color identification? Record your hypotheses in the **Hypothesis** section of your *Stroop Effect Scientific Investigation Report*.

Equipment and Materials

- Two white sheets of paper
- Colored markers or pencils, or a color printer
- Six test participants
- Timer or stopwatch that records seconds

Procedure and Data Collection

1. Prepare two sets of word lists. Each set must be listed on its own sheet of paper and contain 25 words. The control group will be Set #1 and the test group will be Set #2.
 - a. When making the word list of Set #1, each word must be written in the same color as the meaning of the word. For example, if the word is blue, then the word should be written in the color blue. If you like, you may use the example Matching Set of Words above for your Set #1.
 - b. When making the word list of Set #2, each word must be written in a different color from the meaning of the word. For example, if the word is blue, then the word should be written in the color green, for example, or any other color besides blue. If you like, you may use the example Non-Matching Set of Words above for your Set #2.Be sure to keep the cards for each set in the same order throughout your experiment.
2. For the first test participant, instruct him or her to identify the list of colors in order from Set #1 (the control group). Make sure that the participant does not move ahead to the next item before correctly identifying the prior color. Time how long it takes the participant to identify the entire list of colors and record the time in the **Data** section of your *Stroop Effect Scientific Investigation Report*.
3. For the same test participant, instruct him or her to identify the list of colors in order from Set #2 (the test group). Make sure that the participant does not move ahead to the next item before correctly identifying the prior color. Time how long it takes the participant to read the entire list of words and record the time in the **Data** section of your *Stroop Effect Scientific Investigation Report*.

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- Remember to thank each participant and debrief him or her by explaining the objective of the study. Also, let the participant know that you will be sharing your results with him or her after you have completed the study.
- Repeat Steps 2 through 4 for the remaining test participants, making sure to keep the cards of each set in the same order for each participant.
- After you have collected the data for each test participant, calculate the difference between the control group and the test group times. Record the difference for each participant in the third column of the data table in the *Stroop Effect Scientific Investigation Report*.

Data

Use the data table provided in your *Stroop Effect Scientific Investigation Report* to record your data from this scientific investigation. The data table is also shown below:

	Set #1 Time (Control Group)	Set #2 Time (Test Group)	Difference Between Control Group and Test Group Times
Participant #1			
Participant #2			
Participant #3			
Participant #4			
Participant #5			
Participant #6			

Data Analysis

In the **Data Analysis** section of your *Stroop Effect Scientific Investigation Report*, provide responses to the following questions. Make sure to answer each question completely (and show all of your work).

- What was the average difference between the control group and the test group?
- Describe the variation or consistency in the results among the test participants. Did they have similar times, or did they vary greatly? Were most of them similar with only one or two outliers?
- How would you explain the results of your experiment?

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Conclusion

Using the **Conclusion** section of your *Stroop Effect Scientific Investigation Report*, compose three to four sentences describing an overall conclusion based on your data. Were your hypotheses true or false, and how do you know? Use the data and notes that you collected from your investigation/simulation experience to form your conclusion. Make sure that you include information that you gained from data analysis to support your conclusion.

Experimental Sources of Error

In your *Stroop Effect Scientific Investigation Report*, provide responses to the following questions: Are there any sources of error? If so, what are they, and what could be done to minimize error?



Once you have completed the *Stroop Effect Scientific Investigation Report* and Reflection, please submit your work to the dropbox.