

## AP Psychology Summer Work Portfolio

Dear AP Psychology Student:

Welcome to AP Psychology! I am glad that you have chosen to challenge yourself by taking this class, and I am convinced it may be one of the best classes you will ever take! Please read the following important information regarding your textbook and summer reading assignment.

Check out a blue AP Psychology textbook from the media center (*Myers' Psychology for the AP Course, 3rd Edition*)

The following is your summer reading assignment. It is due on the **FIRST** day of school.

1. **Read** Units 1 and 2 (pages 1-77) of your textbook, *Myers' Psychology for AP* by David G. Myers and C. Nathan Dewall, ISBN-13: 978-1-319-07050-2.
2. **Define** all terms on pages 33 and 74. These will be due on the first day of class.
3. Be prepared for a vocab quiz on this material (above) on Day 1. (35 points)
4. Complete the **Summer Experiment Project** (75 points) on next page.
5. Be prepared to take a test over all of the above within first 2 weeks of school.

Late summer work will not be accepted. Failure to complete the Summer Experiment Project may result in removal from the course. You must start early in order to run a successful experiment!

Please contact me via email ([tphillippe@caschools.us](mailto:tphillippe@caschools.us)) if you have any questions. Enjoy your summer! I look forward to growing with you in August.

Grace and Peace,

Mr. Troy Phillippe  
[tphillippe@caschools.us](mailto:tphillippe@caschools.us)  
AP Psychology

Psychology is the study of mental processes and human behavior. In order to study mental processes and keep track of human behavior, scientists design experiments to test cause and effect relationships between variables. As a requirement for entrance into this course, you are expected to **design** the experimental procedures of a study, **conduct** the study according to your experimental design, and **present** your findings during the AP Psychology Summer Symposium during the first week of school. Please follow the steps outlined below to help you along the way:

## **Design and Conduct Your Own Experiment**

Choose from the list of experiments below, you may work with 1 partner to run your study. We will refer to your work on these throughout the year when we reach each unit, so it's important to a good job! All studies will be assigned on a first-come, first-served basis:

- **Biological Bases of Behavior:** Based on "Effect of Caffeine on Reaction Time" by Smith et al. (2013). Measure participants' reaction time to visual stimuli (Stroop Test) under different conditions (e.g., normal, caffeine intake) to explore the influence of caffeine on the nervous system and neurotransmission.
- **Sensation and Perception:** Based on "Selective Attention and the Cocktail Party Phenomenon" by Cherry (1953). Experiment: Create a dichotic listening task to examine participants' ability to selectively attend to one auditory stimulus (words similar or identical to their name) while ignoring another, highlighting the concept of selective attention and thresholds.
- **States of Consciousness:** Based on "Sleep Deprivation and Cognitive Performance" by Pilcher and Huffcutt (1996). Recreate the study by comparing the cognitive performance of participants who had a full night's sleep with those who experienced sleep deprivation. Choose 1 of the following cognitive functions to measure: memory, attention, reaction time, recall.
- **Learning & Conditioning:** Based on "Classical Conditioning of Fear: A Human Fear Conditioning Study" by Olsson et al. (2007). Pair a neutral stimulus (e.g. a specific image or sound) with a mild electric shock (like a shock "prank" pen) to condition a fear response. Measure physiological responses (e.g. heartrate) and subjective self-report scales ("on a scale of 1-10...") of fear to assess the extent of conditioning.
- **Cognition & Memory:** Based on "Working Memory Capacity and Recall Performance" by Engle et al. (1999). Recreate the digit span task used in the study to measure participants' working memory capacity. Assess their ability to recall and repeat a series of digits and compare performance between different lengths of digit sequences.
- **Motivation, Emotion, & Stress:** Based on "Effects of Hunger on Mood and Cognition" by Voegele and Florin (1997). Recreate the study by examining the influence of hunger on mood. Measure participants' mood states before and after consuming a meal or fasting, and compare mood changes between the two conditions.
- **Development Across the Lifespan:** Based on Jean Piaget's body of work. Investigate object permanence in infants OR conservation in young children by observing their reactions to classic object permanence or conservation tasks. Assess how their understanding of the task differs by age.

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- **Personality:** Based on “Big Five Inventory” by John et al. (1991). Administer a publically-available version of the Big Five Inventory (a well-established personality trait inventory) to assess participants' personality traits. Analyze the results to explore trait theories of personality. Analyses should compare measures of traits in the subjects in an attempt to identify meaningful patterns and relationships.
- **Intelligence Testing & Individual Differences:** Based on "Fluid intelligence and working memory capacity" by Conway et al. (2005). Design a study to investigate the relationship between fluid intelligence and working memory capacity. Administer cognitive tasks and analyze the data to examine if fluid intelligence seems to influence working memory or vice versa.
- **Social Psychology:** Based on the *conformity* studies conducted throughout the 1950s by Solomon Asch. Adapt Solomon Asch's conformity experiment by presenting participants with a series of line length comparison tasks and measuring their conformity to incorrect group responses. Analyze the extent of conformity and factors influencing it.

### Conduct the Experiment & Gather Your Data

1. Follow the experimental design that you generated (above) and record all of your data.
2. State the research question and **hypothesis**
3. **Operational definitions** for the **independent** and **dependent variable(s)**
4. State the design of the study (the goal is to be clear enough that another researcher could read your instructions like a cookbook recipe and re-do your whole experiment just from your instructions -- this is known as **replication**)
  - 4.1. Describe how you selected the participants for your study;
  - 4.2. Explain how you will meet the ethics standards outlined on pg. 62 (be specific, especially about **informed consent** and **debriefing**);
  - 4.3. Make a list of the materials needed for anyone who wants to **replicate** your work;
  - 4.4. Provide a description of your step-by-step procedures to do the experiment (how are you going to conduct it? Include things like specific questions/surveys you will use, instructions you will give, what order you will go in, how many days, etc.);
  - 4.5. Explain the difference between your **experimental group** and your **control group** (or **control condition**). Be sure to describe your **random assignment** process;
5. Cite & Reference- Provide a summary of the research that inspired your own and compare the findings of each.

### Present the Experiment

6. Create a poster to display your findings and be prepared to present your research to your classmates.
7. Posters must contain:
  - 7.1. An Abstract of no more than 200 words (a good place to outline steps 4.1-4.5 above)
  - 7.2. Everything else from the “conduct” step (including your data and analyses)
  - 7.3. Visuals to represent your study and your findings (graphs are great!)

7.4. What other vocabulary concepts from Chapter 1 or 2 (Module 1-8) are applicable to your research? What other course topics do you predict this experiment will connect to?

An EXAMPLE of a sample student project is provided here:

research question:

# HOW DOES Caffeine affect the brains processing speed?



Hypothesis: I hypothesize that caffeine will increase the brain's processing speed and reaction time

change  
mean: -8.26  
median: -8.86  
sd: 6.30

academic study:

Ben Zheng and several of his colleagues conducted a similar experiment to the one I have conducted. They were studying the mind's cognitive effects from caffeine, but tested different levels of caffeine rather than just one. In their study they found that "ingestion of low-dose caffeine had greater effect on cognition and brain activation than had moderate and high doses." They stated that this occurs because "caffeine acts as a central stimulant and enhances cognitive and psychomotor functioning, particularly during mental and physical fatigue, through effects that enhance alertness and vigilance." These findings concur with the results of my own research and hypothesis by showing that caffeine does enhance alertness and brain function.

Zhang, B., Liu, Y., Wang, X., Deng, Y., & Zheng, X. (2020). Cognition and brain activation in response to various doses of caffeine: A near-infrared spectroscopy study. *Frontiers in Psychology, 11*. <https://doi.org/10.3389/fpsyg.2020.01393>

## experimental Design:

Variables: The independent variable is 50mg of caffeine. The dependent variable is the time it takes to complete the stroop test

### Experimental Design

- The first action I took in preparing for the experiment was to find a group of participants for the study. I did this by texting my friends and family to see if they were interested in participating.
- I made sure that the participants had informed consent so they knew what they were agreeing to before they started. I informed them that they will be ingesting 50mg of caffeine and taking the stroop test. They were also informed that they will be requested to not have any caffeine leading up to the test. They then had the chance to either accept or reject participating. The participants will be informed that they are allowed to quit the experiment whenever they like. At the end of the experiment I will debrief the participants on their results and inform them on the conclusions drawn from them.
- In order to complete the experiment it requires 50mg of caffeine [I used a shot of espresso], a Stroop Test (a test that requires individuals to view a list of words that are printed in a different color than the meaning of the word. For example, the word "red" would be written in the color blue. The test begins and the individual reads aloud what the color of the word is moving down the line, until completion), and a timer. I used an iPhone for the stroop test and used milk and creamer to be added to the espresso.
- Steps

- Step One- The individual will complete a Stroop Test and I will time how long it takes them to complete it as the control for the experiment.
- Step Two- I will record their time
- Step Three- Using 50mg of caffeine from a shot of espresso, I will make the participant a cup of coffee using espresso, milk, and creamer.
- Step Four- The individual will drink all of the coffee and set a thirty minute timer on their phone as soon as they are finished
- Step Five- After the thirty minutes are up, the individual will take the stroop test again
- Step Six- I will record the time from the second test and compare it to the first.
- Step Seven- repeat steps 1-6 with each individual and calculate the mean, median, mode, and standard deviation from the change in time.

control	experimental	change
25.40	28.95	+3.55
41.87	24.81	-17.06
31.56	17.05	-14.51
35.64	29.93	-5.71
22.59	17.63	-4.96
31.72	22.86	-8.86
29.20	18.93	-10.27

## basic:

My experiment is for basic research. There is no particular problem that my project aimed to solve, rather it was used to gain a better understanding of caffeine's effect on our body and our brain. This study can be applied in many different areas and is therefore not applied research.

## Confounding Variable:

The confounding variables to consider for my experiment are the individuals average caffeine consumption per day because this could alter the way that caffeine affects their brain if they are beginning to build a tolerance for caffeine, their age, and their weight. Another variable could have been the amount of sleep the participants had the night before. I tried to limit the confounding variable by testing individuals that I know drink caffeine on a regular basis, so it would not have a great effect on their times, compared to others.

I predict that this experiment would fall under the course topic psychoactive drugs because caffeine is the most widely used psychoactive drug.

Course topic ↗

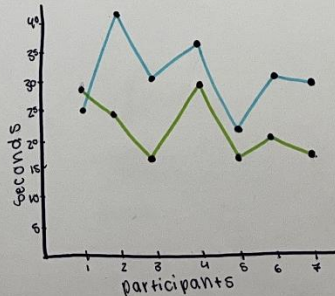
## abstract:

This study was conducted to test the effects of caffeine on the brain. The factor being studied is if caffeine speeds up or slows down the brain's processing speed. The process begins by gathering 7 individuals to willingly participate in the experiment. The process began with the participants taking the stroop test as a baseline/control. Then the individuals drank 50mg of caffeine and then took the stroop test again. Finally, the results of the control group and experimental group were compared. On average, there was a 8.26 seconds decrease in the stroop test. It can be concluded from the results that caffeine speeds up the brain's processing speed.

## Vocab:

Psychometrics- This experiment uses psychometrics through the stroop test so you can accurately measure the mind's ability and cognition  
Replication- This study uses repeated measures as a form of replication to see personal change between the control and the experimental group.

## control vs. experimental



<u>control</u>	<u>experimental</u>
mean: 31.14	mean: 22.88
median: 31.56	median: 22.86
mode: 31	mode: 17
Stan D: 5.92	Stan D: 4.89

Conclusion: The consumption of caffeine generally speeds up the brain's processing and is an effective stimulant.

Anne Marie Krebs

## Here is another example in written form:

1. **Research Question & hypothesis**- How likely are people to conform to their peer group? I hypothesize that less than 20% of my subjects will conform to a wrong idea held by their peer group. (In other words, I hypothesize that 80% of my subjects will break away from their peers when they know that their peers are wrong about something).
2. The **independent variable** is the choice made by their peer group. The **dependent variable** is the participant's choice to conform with their peer group or break away from their peer group.

### Experimental design

3. The first step in my research will be to create a team of confederate helpers (in psychology, a "confederate" is like an actor—someone who works for me but pretends to be a regular person during the experiment). I will email people with a brief explanation of my idea until I have at least 5 team members who will be my people "on the inside."
4. Next, I will email/text invitations to everyone I know until 10 people in my friends or family (none of whom are on my confederate team) agree to be my research subjects. These willing volunteers will complete an **informed consent** slip which asks them to test their visual accuracy (which is deception, but I will explain this to them later in the **debrief**). Once I have 10 subjects, I will use an online sorting website to randomly split them into groups of 5, and then flip a coin to determine which group will be the **experimental group**. In my experimental group, all of my confederates will unanimously choose the wrong answer on purpose at predetermined times. In my control group, they will give the "correct" answer each time.
5. Before beginning, subjects will be told the nature of the experiment (an experiment to test the visual accuracy of my subjects) and will be told they are allowed to exit the study at any point. They will be debriefed (being told the *true* purpose of my experiment- to see whether or not the subject would go with their peers) at the conclusion of their participation.
6. This experiment requires numbered slides as visual cues for the study. On each slide, an image of Solomon Asch's line comparison charts will be displayed. For example, Slide 1 depicts a "standard line" and then I will ask the participants which of three new lines comes closest to the standard line in length (options A, B, and C). There is no other major need, because I plan on having participants give their responses verbally.
7. Step 1- The researcher will present instructions to the participants.  
Step 2- Researchers will allow participants to ask questions and clarify.  
Step 3- Show Slide 1 and ask participants to verbally, one-at-a-time, express an answer choice (A, B, or C) to indicate which line they think comes closest. Participants 1-4 are confederates who will give predetermined answers. Participant 5 will be my actual test subject, with the goal of observing whether or not Participant 5 will do what Participants 1-4  
Step 4- Repeat step 3 with the remaining slides, one at a time, observing Participant 5's response each time.

Step 7- After all participants have completed the experiment, statistics will be used to determine the percentage of times that a Participant 5 decided to go with their peer group in giving a wrong answer.

You must obtain permission from Mr. Phillippe at [tphillippe@caschools.us](mailto:tphillippe@caschools.us) before you are allowed to conduct your experiment. Design it, then double-check that you are allowed to do it!