

2024



AP[®] Psychology

Sample Student Responses and Scoring Commentary Set 1

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Free-Response Question 2

- Scoring Guidelines**
- Student Samples**
- Scoring Commentary**

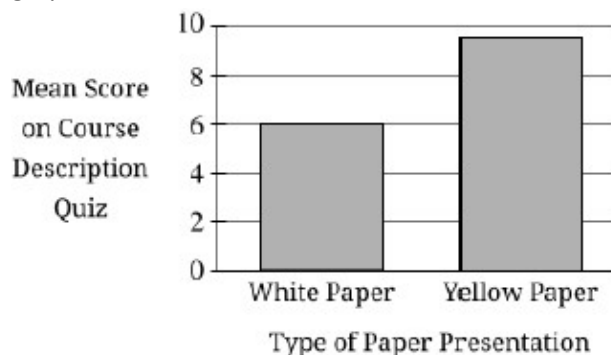
Question 2: Research Design**7 points****General Considerations**

1. Answers must be cogent enough for the meaning to come through. Spelling and grammatical mistakes do not reduce a score, but spelling must be close enough so that the reader is convinced of the word.
2. A response can earn points only if the student clearly conveys what part of the question is being answered. It is possible to infer the part of the question being answered if it is consistent with the order of the question.
3. The response must apply the concept to the prompt. A definition alone will not earn the point, but a clear definition can support the application.
4. Examples provided in the Scoring Guidelines for each of the points are not to be considered exhaustive.
5. Within a point, a response will not be penalized for incorrect information unless it *directly contradicts* correct information that would have otherwise earned a point. For example, if a response applies a concept in two contradictory ways (such as identifying both the independent and dependent variables as the independent variable or describing proactive interference as interference from both older and newer information), the point is not earned.

NOTE: In certain cases, a response will not score if it includes a correct answer amongst multiple incorrect answers related to the same general concept/theory (e.g., a response that describes the Big Five trait of conscientiousness as being diligent, trusting, highly emotional, outgoing, and intellectually curious).

6. Within a bulleted question part, if the response addresses details from a scenario other than the one in the prompt, the point is not earned.

Part A Professor Gonzalez hypothesizes that students will remember more information from his detailed course description if it is printed on yellow paper than if it is printed on standard white paper. To test this hypothesis, he put the names of all his students into a bowl, then drew out names to assign them to two different groups. He gave one group of the students in his class a course description printed on white paper and gave the other group of students a course description printed on yellow paper. Students were instructed to thoroughly read the description outside of class in preparation for their next class. In the next class, he gave all students a ten-question quiz asking them about the information found on the course description. Professor Gonzalez then compared the number of correct answers for each group of students. The statistically significant results are depicted in the graph.



State the operational definition of the dependent variable.**1 point**

Response must indicate that the dependent variable is operationally defined as the student's score on the course description quiz.

Acceptable explanations include:

- *The dependent variable is operationally defined as the score on the course description quiz.*
- *The dependent variable is the quiz score/grade on the quiz.*
- *The number of correct answers on the quiz is the dependent variable.*

Unacceptable explanations include:

- *The dependent variable is the type of paper used.*
 - *The student's result on the quiz, and that's the dependent variable.*
 - *The mean score on the quiz.*
-

Identify the experimental group.**1 point**

Response must indicate that the experimental group is the group with the course description printed on yellow paper.

Acceptable explanations include:

- *The experimental group is the people who have the yellow paper.*

Unacceptable explanations include:

Responses that state the yellow paper without indicating the people/group.

- *The experimental group is the yellow paper.*

Responses that state a control group instead of an experimental group.

- *Example: The control group is the group with the yellow paper.*

References to taking the quiz on yellow paper do not score.

In addition to the manipulation of an independent variable, identify the procedure Professor Gonzalez used to make this study a true experiment.**1 point**

Response must indicate that the procedure used to make this a true experiment is random assignment.

Acceptable explanations include:

- *Professor Gonzalez randomly assigned the participants to groups.*
- *Professor Gonzalez put people in groups randomly.*
- *Professor Gonzalez puts the names of all students into a bowl and pulls them out of a bowl.*

Unacceptable explanations include:

Responses that refer to random selection/sampling.

- *Professor Gonzalez used random selection to make this a true experiment.*
-

Explain how the data as presented in the graph do or do not support Professor Gonzalez’s hypothesis. **1 point**

Response must indicate that data support the hypothesis because the experimental group (i.e., the yellow paper group) scored higher on the test.

Acceptable explanations include:

- *Professor Gonzalez thought that the experimental group would score higher, and they did, so the data support the hypothesis.*
- *The bar for the yellow paper group is higher than the bar for the white paper group, which supports the hypothesis.*
- *The control group/white paper group scored lower than the experimental group/yellow paper group, which is what Professor Gonzalez expected.*

Unacceptable explanations include:

Responses that do not provide an explanation for data supporting the hypothesis.

- *The data do not support the hypothesis.*
- *The data **support the hypothesis** (needs to make clear what the hypothesis was).*

Part B Explain how each of the following might relate to a student’s performance on any quiz.

Context-dependent memory

1 point

Response must indicate that the student’s memory retrieval is affected if some external element (e.g., room, sensory cues, equipment) that is present when the information was learned/encoded is present/the same or absent/not the same as when they take a quiz.

Acceptable explanations include:

- *If students learn the information in a particular classroom, they should take a quiz in that same classroom so they can use the surroundings to cue them for their memories.*
- *If a student chews gum while studying, they should chew gum while taking a quiz.*
- *If students sit in different seats taking the quiz than when they learned that information, they will do worse on the quiz.*

Unacceptable explanations include:

- *Students must consider context in order to remember things well enough for their quiz.*

Responses that refer only to mood-dependent or state-dependent memory.

- *If a student is happy while learning the information, they will do better if they are happy when they take the quiz.*
-

Yerkes-Dodson law**1 point**

Response must indicate that students would perform best under a level of optimal arousal.

OR

Response must indicate that students would perform worse if they were under- or over-aroused.

Synonyms for “under-aroused” can include a reference to the amount (e.g., too little, under, insufficient).

Synonyms for “over-aroused” can include a reference to the amount (e.g., too much, overly, super).

Acceptable explanations include:

- *Students might be too aroused on the quiz, so they don't do well.*
- *Students may be at their optimal arousal, so they end up doing well on the quiz.*
- *Students are extremely disinterested/very bored in the class, so they don't do well on a quiz.*
- *Students who have a high level of arousal perform poorly on the quiz.*

Unacceptable explanations include:

Responses that refer to arousal without quantity (i.e., too much, too little).

- *Students may be relaxed, so they do well on the quiz.*
- *Students who are excited do poorly on the quiz.*

Low level of the Big Five trait of conscientiousness**1 point**

Response must indicate that a low level of an enduring characteristic of conscientiousness would hinder student performance on the quiz (e.g., not being diligent, being less hardworking, being unorganized, being undisciplined, being irresponsible, being unprepared, etc.).

Acceptable explanations include:

- *Students who aren't hardworking may be hindered from doing well on the quiz.*

Unacceptable explanations include:

- *Students who are diligent do better on the quiz.*
- *Students who did not study hard did poorly on the quiz.*

Total for question 2 7 points

Important: Completely fill in the circle that corresponds to the question you are answering on this page.

Question 1

Question 2

Begin your response to each question at the top of a new page. Do not skip lines.

- The operational dependent variable is the measurable outcome of the manipulation of the independent variable. The independent variable is what is being manipulated in the experiment. The operational dependent variable is the ~~amount of students in each type~~ test scores each ~~type~~ group of students receive.
- The experimental group is the group in the study that is given the stimulus that is desired to be tested to see if their behavior deviates from that of the control group that is given the normal stimulus.
- In order to ~~make~~ make a true experiment, one must manipulate the independent variable - which Professor Gonzalez already did, and also randomly assign the participants of the experiment to the control and experimental groups. This is to ensure that there are no external factors impacting the results from too much similarity between people in groups.
- The data shown in the graph shows that students given the information on yellow paper did significantly better than those on white paper. This supports Professor Gonzalez's hypothesis, as he predicted that they would do better as well.
- Context dependent memory is the idea that individuals can recall things better in situations similar to the ones they were in when they were first given the information. Students who read the information on yellow paper and were given a quiz on white paper may do ~~more~~ worse according to the idea of context dependent memory because of the difference.

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Question 1

Question 2



Begin your response to each question at the top of a new page. Do not skip lines.

• The Yerkes-Dodson law relates to stress, and ~~at~~ how individuals process it. This law argues that there is an optimal level of stress, and anything above that reduces an individual's ability to perform. A student may be very stressed, passed the level that would improve his performance, causing him to do badly.

• The Big Five ~~is~~ trait test measures personality by giving individuals numerical ratings in ~~the~~ the following categories: Openness, conscientiousness, extraversion, agreeableness, and neuroticism.

The Conscientiousness segment refers to how organized an individual is. A student scoring low on conscientiousness may be predisposed to failing the quiz because ~~of their~~ their lack of organization, causing them to forget their quiz was on that day, which in turn, causes them to neglect studying for it.

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Question 1

Question 2

Begin your response to each question at the top of a new page. Do not skip lines.

Question 2: Part A:

- The operational definition of the dependent variable is the mean score on ~~course~~ the course description quiz. This score is impacted by the type of paper presentation/color.

- The experimental group is the group of students that received a course description on yellow paper.

- Professor Gonzalez made this study a true experiment by using random assignment. ~~He did~~ ~~the~~ he did this by picking names out of a bowl randomly.

- The data presented in the graph supports Professor Gonzalez's hypothesis. His hypothesis stated that his students will remember more information from his detailed course description if it were to be printed on yellow paper rather than white paper. This is proven by the graph because the mean score on the course description ^{quiz} for students with the yellow paper is higher than ~~the mean score for students that read the course description on the white paper~~ than the mean score on the course description quiz for students that read the material off the white paper.

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Question 1 Question 2



Begin your response to each question at the top of a new page. Do not skip lines.

Question 2: Part B:

- A student's performance on any quiz may be affected by a context-dependent memory. For example, a student that thinks about a certain memory while studying for a test, than while ~~the~~ taking the test thinks about the same memory will ~~more~~ likely be able to recall more information that they studied.

- A student's performance on a quiz may be affected by the Yerkes-Dodson law. For example, if a student ~~that is~~ taking a test is very stressed out or anxious they may perform worse on said test due to their state of mind. While a student who is calm and in a focused state of mind, shown by the highest part of the Yerkes-Dodson Curve, will be able to perform better at the test/task at hand.

- A low level of the Big Five trait of conscientiousness ~~may~~ might relate to a student's performance on a quiz. ~~For~~ A low level of conscientiousness may be shown through traits such as a close-minded individual. ~~This may~~ ~~be personality trait may affect~~ A low level of conscientiousness may negatively affect a student's ability to think divergently while answering questions on a quiz and hinder their ability to problem solve. ~~in~~

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Question 1

Question 2



Begin your response to each question at the top of a new page. Do not skip lines.

ways the student hasn't before

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Question 1

Question 2



Begin your response to each question at the top of a new page. Do not skip lines.

Part A - the dependent variable is what's being measured which in this case would be ~~how~~ how much information was remembered based off the color of the paper. The experimental group is the two different groups of students. Each group had different colored papers. The procedure professor Gonzalez used was giving the exact same instructions to ~~both~~ both experimental groups but only changing the color of the paper. The data presented in the graph does support professor Gonzalez's hypothesis because it shows that the students who had the yellow paper had higher mean scores than the students who had white paper even though both had the same information just different paper colors. ~~Context~~ Part B - context dependent memory effects what score the students got and how well they remembered it based off what it was given on. Yerkes-Dodson law relates to a student's performance because it shows how student's memory and well doing on the test is displayed. The low level of the Big Five trait of conscientiousness is related to a student's performance on any quiz because

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Question 1 Question 2



Begin your response to each question at the top of a new page. Do not skip lines.

A low level of the Big Five trait of conscientiousness can lower a student's confidence and well being and cause the student to become so stressed to take the quiz and end up not doing well on it.

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Question 2

Note: Student samples are quoted verbatim and may contain spelling and grammatical errors.

Overview

Responses to this question were expected to demonstrate an understanding of various characteristics of psychological research and to show how specific psychological terminology applied to the scenario, which described a study examining the effects of different-colored paper on students' ability to remember information from a detailed course syllabus. The responses needed to demonstrate an understanding of the operational definition of the dependent variable, the experimental group, random assignment's role in an experiment, and whether the data presented support the hypothesis. Additionally, responses were expected to apply context-dependent memory, the Yerkes-Dodson law, and the Big Five trait of conscientiousness.

Sample: 2A

Score: 6

The **operational definition of the dependent variable point** scores because the response clearly states the score on the quiz is the operational definition. The **experimental group point** does not score because the response does not identify the experimental group as the students who received the course description on yellow paper. The **experimental procedure point** scores because the response states that random assignment was used to make two groups. The **data interpretation point** scores because the response states the experimental group scores higher, which supports the hypothesis. The **context-dependent memory point** scores because the response explains that memory retrieval would be improved if the color of the paper were the same for the course description and quiz. The **Yerkes-Dodson law point** scores because the response correctly indicates that peak performance occurs at optimal levels of arousal. The **conscientiousness point** scores because the response correctly indicates that a low level of conscientiousness (“lack of organization”) would hinder performance.

Sample: 2B

Score: 4

The **operational definition of the dependent variable point** does not score because the response refers to the mean score instead of the individual student's score on the quiz. The individual student's scores were measured by the researchers. The mean score is a statistic calculated using the measured scores. The **experimental group point** scores because the response indicates that the experimental group received the yellow paper. The **experimental procedure point** scores because the response refers to random assignment. The **data interpretation point** scores because the response indicates that the hypothesis was supported because the mean score was higher with the yellow paper. The **context-dependent memory point** does not score because the response does not refer to an external context where the memory originated, which then cues retrieval. The **Yerkes-Dodson law point** scores because “very stressed out or anxious” establishes over-arousal, and the response indicates that performance will be worse in that situation. The **conscientiousness point** does not score because “close-minded” and “think divergently” are not enduring characteristics of the conscientiousness trait.

Question 2 (continued)

Sample: 2C

Score: 1

The **operational definition of the dependent variable point** does not score because the response does not state that the score on the quiz is the operational definition. The **experimental group point** does not score because the response does not identify the experimental group as the students who received the course description on yellow paper. The **experimental procedure point** does not score because the response does not identify the use of random assignment. The **data interpretation point** scores because the response states the experimental group scores higher, which supports the hypothesis. The **context-dependent memory point** does not score because the response does not refer to an external context where the memory originated, which then cues retrieval. The **Yerkes-Dodson law point** does not score because the response does not reference any connection between the level of arousal and student performance. The **conscientiousness point** does not score because the response does not correctly indicate how a low level of conscientiousness would hinder performance.