

**AP<sup>®</sup> STATISTICS**  
**2011 SCORING GUIDELINES (Form B)**

**Question 2**

**Intent of Question**

The primary goals of this question were to assess students' ability to (1) distinguish an experiment from an observational study; (2) critique statistical information, in particular whether or not researchers are justified in making a specific conclusion based on the given information; (3) recognize and describe a potential problem with a study that lacks random assignment or blinding.

**Solution**

**Part (a):**

The study was an experiment because treatments (D-cycloserine or placebo) were imposed by the researchers on the people with acrophobia.

**Part (b):**

No, the experiment was designed to compare the D-cycloserine group with a control group that received the placebo. The researchers can conclude that the D-cycloserine pill and two therapy sessions show significantly more improvement than a placebo and two therapy sessions. However, there is no basis for comparison with another group of people with acrophobia who received eight therapy sessions and no pill.

**Part (c):**

One example is that if the therapists were allowed to choose who received the placebo and who received D-cycloserine, they might assign the people with more severe acrophobia to one of the groups and the people with less severe acrophobia to the other group. Thus, the improvement after only two therapy sessions could be related to the initial severity of the acrophobia rather than to the effects of D-cycloserine.

**Scoring**

Parts (a) and (c) are scored as essentially correct (E), partially correct (P), or incorrect (I). Part (b) is scored as essentially correct (E) or incorrect (I).

**Part (a)** is scored as follows:

Essentially correct (E) if the response indicates that this was an experiment, *AND* the explanation clearly communicates that two treatments were imposed.

Partially correct (P) if the response indicates that this was an experiment, *BUT* the explanation does not clearly communicate that two treatments were imposed.

*Note:* If the response indicates that this was an experiment because there was random assignment *to treatments*, this implies imposition of treatments and is scored as E. If the response does not clearly state that the random assignment is *to treatments*, this is scored as P.

Incorrect (I) if the response indicates that this is an observational study *OR* if the explanation is missing or incorrect.

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**Question 2 (continued)**

**Part (b)** is scored as follows:

Essentially correct (E) if the response says “no” *AND* clearly explains why this is not reasonable based on the fact that there was no experimental group that received eight therapy sessions and no pill.

Incorrect (I) if the response provides an answer with an incorrect or no justification.

**Part (c)** is scored as follows:

Essentially correct (E) if the response indicates that this method of assignment might create experimental groups that differ in some systematic way other than the treatment *AND* provides a justification that describes the potential confounding,

*OR*

if the response indicates that if the therapists know who was in which group, it may influence the therapists’ behavior when dealing with or evaluating the people with acrophobia.

Partially correct (P) for any of the following:

- The response indicates that the assignment might create experimental groups that differ in some systematic way, *BUT* does not provide an explanation of the potential confounding.
- The response makes a general statement that the lack of random assignment could lead to confounding *BUT* does not provide an example in context.
- The response indicates that the therapists know who is in which group *BUT* does not give a reason as to why this might lead to a misleading conclusion.
- The response makes a general statement that failure to blind may lead to bias *BUT* does not provide an example in context.

Incorrect (I) if the response fails to meet the criteria for E or P.

*Note:* If the response discusses incorrect conclusions that might result from having the *people with acrophobia* (rather than the *therapists*) choose their own treatments, the response is scored as I, because such a response does not address the question asked.

**4            Complete Response**

All three parts essentially correct

**3            Substantial Response**

Two parts essentially correct and one part partially correct

**2            Developing Response**

Two parts essentially correct and one part incorrect

*OR*

One part essentially correct and one or two parts partially correct.

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**Question 2 (continued)**

**1 Minimal Response**

One part essentially correct and two parts incorrect

*OR*

One or two parts partially correct and one part incorrect