



AP[®] Psychology 2004 Scoring Guidelines

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Question 1

Dr. Franklin investigated the relationship between stress and physical illness. She persuaded a high school principal to require all female athletes in the school to participate in her study. She explained the purpose of her research to the athletes and asked them to use a standard form to rate the severity of their stress over the last six months. More than 250 athletes completed the form. Then Dr. Franklin analyzed the forms returned by the first 100 athletes. She requested the attendance records from the nurse's office for each of those athletes to verify the number of days absent due to illness during the same six-month period. In the debriefing summary that Dr. Franklin sent to the 100 athletes after she completed the study, she stated that athletes who reported more stress also experienced more frequent illness. Dr. Franklin concluded that stress causes physical illness.

- Identify the research method used by Dr. Franklin.
- Describe the operational definitions of the TWO key variables that Dr. Franklin used in the study.
- Based on the information provided, describe ONE appropriate and ONE inappropriate ethical feature of the study.
- Identify ONE statistical technique that Dr. Franklin could use to represent the relationship between the variables in the study.
- Describe TWO aspects of research design that weaken the validity of Dr. Franklin's conclusion that stress causes physical illness.

General Issues

1. Acceptable answers must include sentences (subject/verb): no stand-alone pictures or outlines.
2. You may establish which point is being discussed by the structure of the essay if it is written in order of the questions asked.
3. A point once earned cannot be lost by a later wrong statement unless immediately contradicted.

POINT 1: Research Method

- correlation
- survey
- questionnaire

NOTES: Ignore use of the word "experiment" as a synonym for study. "In this experiment, Dr. Franklin used a survey" counts. However, the specific phrase "correlational experiment" is a direct contradiction and will not be counted.

Don't Score:

- "experiment" as the method ("Dr. Franklin conducted an experiment that used surveys.")
- longitudinal study
- case study
- observational study

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Question 1 (cont'd.)

POINT 2: Operational Definition of Stress

- stress severity rating
- stress questionnaire
- stress score
- self-report of stress (“self-report” implies a survey was used)

NOTES: a) The operational definition requires identification of the method by which stress was measured (i.e., reference to the stress instrument used by Franklin).

b) A good operational definition of stress can use the exact language from the question.

Don't Score:

- “stress,” “stress level,” or “amount of stress”

POINT 3: Operational Definition of Illness

- number of days absent (don't need to specify “due to illness” or “six-month period”)
- measured from attendance records

NOTE: A good operational definition of illness can use the exact language from the question.

Don't Score:

- “number of days sick” (illness wasn't directly measured, attendance was)
- procedures (e.g., “asked when they were sick”)
- definition of illness (can't just describe illness or list symptoms)

POINT 4: Appropriate Ethical Characteristic (*must be based on information provided*)

- shared statement of purpose with participants
- debriefed participants

Don't Score:

- ethical practices not mentioned in question (e.g., providing confidentiality, getting IRB approval)

POINT 5: Inappropriate Ethical Characteristic (*must be based on information provided*)

- debriefed only some (100 of 250) participants (can't get both points 4 & 5 for saying “only some debriefed”)
- were forced to participate (required by principal) / weren't allowed to quit
- no consent (student or parent)
- didn't get participant's permission to look at attendance records (invasion of privacy)

Don't score:

- poor design characteristics (e.g., “used only 100 when she could have used 250”)
- did not use an IRB procedure (does not restrict answer to details provided in the question)

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Question 1 (cont'd.)

POINT 6: Statistical Technique

- calculate the correlation
- correlation coefficient
- scatter plot / correlation graph (“graphing stress on one axis and absences on the other”)
- calculate regression line

Don't score:

- analysis of variance, t test, z score, chi square test, inferential statistics

POINTS 7 and 8: Two Design Features that Weaken the Conclusion

Two parts required for each point: Identifying the problem and saying how or why it is a weakness. The two features cannot be the same issue (both points can't come from same bullet below).

- **causation** is not established
 - correlation is not causation (“why” implied) NOTE: can be imbedded in point 6, but not in others
 - direction of cause could be reversed (“illness could cause stress”)
 - 3rd variable: Illness could be caused by a variable other than stress
 - “illness could be caused by another variable that Franklin didn't measure”
 - example of a 3rd variable that affects the health of all participants, not only particular individuals: “absences could have been caused by the fear of violence in the school”
 - Don't score: “a student who plays soccer has more stress than others”
- testing only girls (or athletes, high school students) limits ability to **generalize** or is not **representative**
- took only the first 100 respondents (sample problem), so didn't have a **random sample**
- should have used more precise measures of stress or illness to improve the **operational definition** (“the illness measure is bad because absences may be due to things other than illness”)
- **response bias** (specified problem tied to “why” of response bias)
 - “Franklin told participants about the research before she collected data, biasing the results.”
 - “Students might lie about their stress, producing inaccurate data.”
 - Surveys, in general, are open to social desirability (trying to look good), biasing responses.

Don't Score:

- “no random assignment”
- “boys weren't allowed to participate” without link to generalization or representativeness
- “sample size too small”
- can't just disagree with Dr. Franklin's conclusion--must identify design problem (e.g., “can't conclude that stress causes physical illness because it is not an experiment” scores only with underlined portion)

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Question 2

Time is an important variable in many psychological concepts. Describe a specific example that clearly demonstrates an understanding of each of the following concepts and how it relates to or is affected by time. Use a different example for each concept.

- Critical period
- Fluid intelligence
- Group polarization
- James-Lange theory of emotion
- Presentation of the conditioned stimulus (CS) and unconditioned stimulus (UCS) in classical conditioning
- Refractory period in neural firing
- Sound localization
- Spontaneous recovery

General Considerations

1. The two overriding criteria for scoring each point are to demonstrate understanding of the concept and to relate the concept to time.
2. Because it is difficult to demonstrate understanding of some concepts (for example, the refractory period) with an example, well-phrased descriptions or definitions may be substituted for examples. However:
 - a. if a description and an example *directly contradict* one another, do not score the point.
 - b. if a good example is coupled with a weak or ambiguous description (or vice versa), score the point.
3. Information must be presented in context. That is, it must be clear that the student is discussing a particular point before the point can be awarded.
4. Answers must be presented in sentences, and sentences must be cogent enough for student's meaning to come through. Spelling and grammatical mistakes do not reduce a student's score, but spelling must be close enough so that the reader is convinced of the word.
5. A student will not be penalized for misinformation unless it directly contradicts correct information that would otherwise have scored a point.

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Question 2 (cont'd.)

Point 1: Critical period

The student **must both**:

1. establish the vital nature of critical periods in the developmental process by a description or example of how:
 - a. the selected critical period is *necessary* for healthy development, or
 - b. a disruption of the normal developmental process during the critical period leads to abnormal development, or
 - c. greater sensitivity to outside influences (such as drugs) during the critical period can negatively impact development.
2. identify an appropriate developmental time period to establish the critical period. For example, the time period may be identified as “childhood.”

Typical examples:

1. “Baby ducks must imprint and begin to follow their mothers during a critical period shortly after their birth.”
2. “Children are predisposed to learn language easily during childhood.”
3. “Exposure to teratogens like drugs can interfere with normal prenatal development.”

Traps:

1. Do not score the point if the student describes a time period but is missing the critical nature of the development which is to occur during that window (“Children learn language during childhood” does not score).
2. Do not score the point if a concept or theory (e.g., “imprinting,” “language acquisition theory”) is merely mentioned by name without a description or illustrating example.

Point 2: Fluid intelligence

The student **must both**:

1. include a *dynamic cognitive component* (e.g., reasoning ability, problem solving, flexibility, speedy information processing, etc.) in the example or description of fluid intelligence.
2. establish a time relationship appropriate to fluid intelligence by describing:
 - a. the decline of fluid intelligence over time, or
 - b. how people with greater fluid intelligence require less time to complete cognitive tasks such as problem solving.

Typical examples:

1. “Fluid intelligence, the ability to think and solve problems, decreases as one ages.”
2. “People with less fluid intelligence take more time to solve puzzles than people with more fluid intelligence.”

Trap: Do not score the point if the student confuses fluid intelligence with crystallized intelligence or general knowledge.

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Question 2 (cont'd.)

Point 3: Group polarization

The student **must** both:

1. establish that group polarization means that a group's predominant view, attitude, or opinion becomes stronger or more extreme. It is important that the student get across the idea of an intensification of a group's opinion rather than a person changing his or her attitude to become more like the group (conformity).
2. demonstrate an understanding that this happens after or as a result of time for group interaction or communication.

Typical examples:

1. "A jury often becomes more convinced of a defendant's guilt or innocence as deliberations continue."
2. "Prejudicial attitudes become more extreme when prejudiced people talk with each other."
3. "Opinions expressed in an Internet discussion group about terrorism become more extreme the longer the group is in existence."

Traps:

1. Do not give credit for answers that focus on other social psychological concepts such as conformity or peer pressure.
2. Do not give credit for the notion of forming *two* extreme views within a group or a "widening of the gap" phenomenon produced through interaction with others. Group polarization means the whole group moves in the same direction.
3. Do not give credit for a change in *behavior* unless a corresponding change of view, attitude, or opinion is also mentioned.

Point 4: James-Lange theory of emotion

The student **must** demonstrate, through description or example, that emotional experience is a two-step process whereby a physiological or behavioral response precedes the emotion. The student does not need to specify the original stimulus event.

Typical examples:

1. "I'm running from the mean dog, therefore I'm scared."
2. "I'm screaming, so I'm afraid."
3. "I'm crying, I must be sad."

Trap: Do not score the point if the student's answer implies that the physiological and emotional responses are happening simultaneously ("I'm crying and I am sad").

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Question 2 (cont'd.)

Point 5: CS—UCS

The student **must** use classical conditioning terms *or an example* to establish any one of the following:

1. the CS should come before the UCS, or
2. conditioning is weaker if the CS doesn't come before the UCS, or
3. conditioning is stronger with a short separation between the CS and the UCS, or
4. stronger conditioning occurs with repeated pairings of the CS and the UCS or if the CS and UCS are paired over time.

Typical examples:

1. "In Pavlov's experiment, the bell comes before the meat."
2. "Classical conditioning works best when the CS occurs shortly before the UCS."

Traps:

1. Do not score the point if a student uses the terms incorrectly in his or her example (e.g., do not score "In Pavlov's experiment, the UCS, a bell, is presented before the CS, food.")
2. Saying that the CS and UCS are "associated," "paired," or "correlated" does not establish that the CS comes before the UCS.

Point 6: Refractory period

The student must establish that it takes time before a neuron can ready itself to generate a second action potential ("fire again"). Note that:

1. if a student says the cell is "at rest" or "resting," he or she must differentiate between this rest and the cell's resting potential by noting that, during the refractory period, the cell is recharging, recovering, or unable to fire.
2. a student may use an analogy (e.g., "a neuron is like a camera flash" or "a neuron is like a toilet") to establish the point if the student establishes the notion of recharging.

Typical examples:

1. "The refractory period is the time it takes for a neuron to repolarize so it can fire again."
2. "A refractory period is like the time when a camera flash is recharging so it can be used again."

Trap: Do not score "The refractory period is when the neuron is at rest" because it does not establish the idea that the cell is readying to fire again.

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Question 2 (cont'd.)

Point 7: Sound localization

The student **must** both:

1. establish that sound localization requires input from both ears.
2. indicate that sound localization is possible because the sound waves reach the nearer ear before or in less time than they reach the more distant ear.

Typical examples:

1. "A sound to your left reaches your left ear slightly before it reaches your right ear, allowing us to determine the location of the sound."
2. "It is difficult to pinpoint a sound coming from directly in front or directly behind you because it reaches both ears at the same time."

Traps:

1. Do not score the point if the student refers to intensity or distance of a sound without noting the importance of a two-ear or binaural difference.
2. Do not score the point if the student refers to two ears without establishing the importance of a time differential.

Point 8: Spontaneous recovery

The student **must** establish both:

1. Reference to extinction, partial extinction, or the diminishing/decreasing of a response.
2. The recurrence of the response after a rest period. Do not score the point if the student is clearly confused about the stimulus that leads to the recovered response.

Typical examples:

1. "If Pavlov's dog's response to the bell was extinguished, it might return after a period of time passed."
2. "A pigeon in a Skinner box would stop pecking if it no longer received food. However, the next time it was placed in the box, it would begin pecking."

Trap:

1. Do not score the point if the student discusses reconditioning. ("The dog responded when Pavlov gave food again" or "the pigeon began pecking when the food reward was resumed.")
2. Do not score the point unless the student clearly establishes a rest period. "The response recurs later" does not score, but "the response comes back after a rest period" or "the response comes back the next day" are acceptable.