

#1

AP® PSYCHOLOGY
2004 SCORING GUIDELINES

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

AP® PSYCHOLOGY
2004 SCORING GUIDELINES

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)

**AP® PSYCHOLOGY
2004 SCORING GUIDELINES**

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)

AP® PSYCHOLOGY
2004 SCORING COMMENTARY

Question 1

Sample: 1A

Score: 1

- Point 1: The research method was not that of a case study.
- Point 2: No operational definition of stress is offered.
- Point 3: No operational definition of illness is offered.
- Point 4: Working out or not is not an ethical factor.
- Point 5: Participation in athletics is not an ethical factor.
- Point 6: Testing only women is not a statistical technique.
- Point 7: "There might be other factors as to why they are getting sick," such as the girls not sleeping properly, is scored as a 3rd variable causing illness.
- Point 8: The criticism that the data were collected from only one school is not tied to the validity problem of generalizing to populations beyond the high school.

Sample: 1B

Score: 4

- Point 1: The research method was not that of a case study.
- Point 2: "How stressed out the ladies were" does not refer to the stress instrument.
- Point 3: "How often they missed school due to illness."
- Point 4: "She still explained the purpose of the study to the athletes."
- Point 5: "This information should be confidential."
- Point 6: "Correlation diagram." This student also scores the point with "the y axis could represent the stress level and the x axis could represent the days of school missed."
- Point 7: Using only females in the study alone does not address the issue of generalization or representativeness.
- Point 8: "She tested 250 but only analyzed the first 100" is not enough. There is no reference to random sampling.

Sample: 1C

Score: 8

- Point 1: "The research method used by Dr. Franklin was a survey."
- Point 2: "Having each participant rate the severity of their stress."
- Point 3: "By looking up the attendance records."
- Point 4: "Explained the purpose of her research."
- Point 5: "Require all female athletes to participate."
- Point 6: "Correlation graph."
- Point 7: "She should have analyzed all 250 forms or picked 100 at random."
- Point 8: Measuring illness by absences from school "is a weak assessment" because students might be out of school for reasons other than illness (or come to school when ill).

Dr. Franklin's research method included Case Studies. This method was also used by Freud and seen as very effectful. ~~see~~ what a case study is, is that its a individual study of the group. Because Dr. Franklin gave out a standard form she was able to rate the athletes stress and illnesses as individuals, as well as in a group manner.

In Dr. Franklin's study there is the constant which is the stress that comes with athletics, and there is the variable which is the illness, which may or may not follow the stress caused by the athletics to the athletes. Therefore Dr. Franklin can continue her study to watch these factors, and to ~~control~~ manipulate them.

One appropriate ethical feature is that one can assume that whenever one works out and has physical stress, it also causes physical illness - but

can be ~~possibly~~^{correct}. One inappropriate ethical feature is that there can be a reason why in this certain school the girls ~~do~~ feel physically sick after or while participating in athletics and the reason for that can be the school itself. There are many factors included in this study, therefore nothing can be a fact.

One statistical technique that Dr. Franklin could use to represent the relationship between the variables in the study is that she only did the study on females. It is a fact in science that men are more ~~physically~~ ~~stronger~~ physically than women, therefore if this study was done to both men and women ~~and~~ in this high school who participate in athletics- the results could be much different. Because men can endure more than women physically - they might not get sick either as often as women or as quickly. Therefore

this fact weakens the reliability of the results when it comes to the topic of stress and physical illness, not the effects of stress and physical illness on women.

Lastly two aspects could again weaken the validity of Dr. Franklin's conclusion. The first would be that the girls could be unhealthy- because they are so active they might not be eating properly nor sleeping properly- therefore there might be other factors as to why they are getting sick. Secondly there is a problem with the fact that Dr. Franklin is doing this experiment in only one school. The reason for this is because there may be other factors that effect it. For example this high school may be located in a very cold area ~~and~~ and if these athletes play outside - they may get sick because of that. or for example the build of the people of that area may also be a factor

1

Write in the box the number of the question you are answering
on this page as it is designated in the examination.

1A
Pg 3

because is this area full of minorities
or Americans. many things once again
may affect this experiment. Therefore
one may not know whether or not
to trust the validity of the conclusion
that stress causes physical illness,
before the experiment is done to all
types of people and in all case
series.

The research method used by Dr. Franklin is a case study. This investigation gave a question + she tried to answer it "What is the relationship between stress + physical illness."

The 2 key variables in the study were how stressed out the ladies were, and how often they ~~missed~~ missed school due to illness. One of the

appropriate ethical features of this study is that even though it was required to do, she still explained the purpose of the study to the athletes.

One inappropriate ethical feature of this study is that she went and got the students' medical info from the nurse. This information should be confidential and only available to the student and their parents.

One statistical technique Dr. Franklin could use for this study is a correlation diagram. The y-axis could represent the stress level and the x-axis could represent the days of school missed. Something in this study

that weakens the validity is the fact that Dr. Franklin only used females in the study. This study doesn't cover male stress related illness at all. And also, she tested 250 athletes but only analyzed the first 100.

20
1

Write in the box the number of the question you are answering
on this page as it is designated in the examination.

1B

Pg 2

that, were returned to her. ~~the research~~ The research
would have been more valid if she had
analyzed all 250, and if she had added
males to the study.

The research method used by Dr. Franklin was a survey. She had all of the female athletes fill out a standard form (survey) to rate the severity of their stress.

In this study, two key variables Dr. Franklin used operational definitions for were stress and physical illness. She defined stress by having each participant rate the severity of their stress in the last six months. So her survey was used to ~~have each~~ ^{have each} ~~participant~~ ^{athlete} rate their stress, and this was Dr. Franklin's way of defining this variable. Another key variable in this study was physical illness.

Dr. Franklin ~~used an operational definition for~~ defined illness by looking up the attendance records of the athletes ^{in the past 6 months} and calculating how many days they were absent due to illness. ~~The~~ The number of days absent due to illness was ~~the~~ Dr. Franklin's operational definition for physical illness.

One appropriate ethical feature of this study is that Dr. Franklin explained the purpose of her research to the athletes before giving them the survey. One ~~appropriate~~ inappropriate ethical feature of the study is that Dr. Franklin persuaded the principal to require ~~the~~ all female athletes to

Question 1

Write in the box the number of the question you are answering on this page as it is designated in the examination.

10

Pg 2

~~She~~ participate in her study. This is not ethical because no one should be forced to participate.

A statistical technique Dr. Franklin could use to represent the relationship between the variables in the study ~~is that she~~ is she could show a ~~statistic~~ correlation graph with the independent variable being stress levels and the dependant variable being amount of physical illness. This graph would show that there is a positive correlation between stress and physical illness. Her graph could use the scores of the students on the stress survey to show their stress and relate it to the number of days they had physical illnesses.

There were a few aspects of Dr. Franklin's study that weakened the validity of her conclusion. One aspect of research design that weakens ~~her~~ ~~study~~ ~~that she tested stress with a survey~~ study is that she only analyzed the ~~first~~ forms returned by the first 100 athletes. She should've analyzed all 250 forms or picked 100 at random, but the first 100 could have been people with less stress or those who rushed through the survey. Another aspect of the study that weakens the validity is that she measured

Write in the box the number of the question you are answering
on this page as it is designated in the examination.

Question 1

1C
Pg 3

physical illness by checking the attendance records
and seeing how many days students were out
due to illness. This is a weak assessment.
First of all, the students may have come to school
with physical illnesses. Second of all, they
might have said that their absence was
due to illness even if it wasn't. So ~~that~~ the way
~~Dr.~~ Dr. Franklin measured physical
illness was a weakness in the validity of the study.
In addition, she assumed that the correlation ~~between~~^{between}
the variables meant causation; that stress
caused physical illness, and this assumption
weakens her conclusion.