

Each item is worth 10 points.

1. Rats in Skinner boxes are being trained to press a lever to receive food. A researcher is investigating the effect of food or no food (IV) on number of times the rat presses the lever (DV). Indicate whether each of the following variables is a potential mediator, moderator, or neither. Please be sure to justify your answers.

A. The extent to which the rats learned other behaviors in other environments.

B. The extent to which the rats are hungry.

2. Please read the following essay. Identify the two mistakes and briefly explain why they're mistakes.

Reliability is essentially whether the test produces roughly consistent scores. One way to assess reliability is through a split-half design. A problem with this method, however, is that practice effects may lower reliability scores.

Validity is whether the test is meaningful or explains something worthwhile. One way to measure validity is through convergent validity – if we want to publish the scale, we want our scale to correlate as highly as possible with previously published scales that measure conceptually similar constructs.

3. Super-short answers: Please respond with only one sentence.

A. Is external validity typically an issue with small-n design? Why or why not?

B. Is internal validity typically an issue when conducting correlational research? Why or why not?

4. The following is a recent article from WebMD. What's the big problem with the conclusion drawn in the article? What's an alternative conclusion to draw from the research?

Video Games May Boost Surgeons' Skill

By Miranda Hitti, WebMD Medical News, Feb. 21, 2007

Playing video games may make for sharper surgeons, a new study shows.

The study shows that surgeons who have a history of playing video games for more than three hours per week may be faster and more accurate in certain video-assisted surgery training tests than surgeons who have never played video games.

Gentile's team studied 33 surgeons, including 21 surgical residents, who are relatively new doctors getting postgraduate training. The surgeons attended a 1.5-day workshop in laparoscopic surgery, which uses video technology to help doctors operate through a small incision.

The surgeons weren't total novices at laparoscopic surgery. The residents had done an average of 46 laparoscopic surgeries, compared with an average of 236 laparoscopic surgeries done by the more experienced doctors.

The surgeons completed questionnaires about their video game use. More than half of the surgeons -- 58% -- reported playing video games at some point in their lives. They had played for nearly eight years, on average.

During the laparoscopy workshop, the surgeons took various tests (none of which involved patients) to gauge their laparoscopy surgery speed and accuracy. The surgeons with a history of playing video games for more than three hours per week were the fastest and most accurate on the laparoscopy surgery tests. Those doctors "made 37% fewer errors, were 27% faster, and scored 42% better overall than surgeons who never played video games," write the researchers.

5. Which statistical tests would be most appropriate? Be as specific as possible, and be sure to identify appropriate post-hoc tests if relevant. No need to justify your answers.

A. On Monday, participants took a placebo pill and then took a math examination. On Tuesday, the same participants took a caffeine pill and then took a math examination. On Wednesday, the same participants took a sleeping pill and then took a math examination scored from 1 to 100.

B. Participants were randomly assigned to one of five conditions. When participants entered the lab, they either watched an episode of *Are You Smarter than a Fifth Grader?*, *Dancing with the Stars*, or *Deal or No Deal*. After watching, participants' levels of nausea was measured from 1 to 4.

6. You just finished your Senior Thesis, the abstract of which is presented below. But, at a conference, a student who has never taken psy300 tried to belittle your research. How would you refute his arguments?

Although research has explored the effects of uncomfortably hot temperatures on aggression, little research has investigated the effect of uncomfortably cold temperatures on aggression. In a laboratory, undergraduate students were randomly assigned to spend 15 minutes in a room either kept at 102 degrees, 72 degrees, or 42 degrees. Participants then had the opportunity to presumably inflict pain on another person. Participants in the cold and hot rooms were equally more aggressive than were participants in the comfortable room.

A. How do you know that people in the cold and hot rooms weren't just naturally more aggressive?

B. You didn't run your study on a good sample, so it doesn't mean anything.

7. In just one sentence, please explain the potential problem if...

A. ...your manipulation is too strong.

B. ...your dependent measure is not sensitive enough.

8. Researchers measured whether 16 participants were happy or sad. Then, these participants took an intelligence test and earned scores ranging from 1 to 50. In words and in statistics, describe what the analysis below indicates.

T-Test
Group Statistics

	mood	N	Mean	Std. Deviation	Std. Error Mean
score	happy	8	41.2500	37.78038	13.35738
	sad	8	34.3750	1.59799	.56497

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
score	Equal variances assumed	11.001	.005	.514	14	.615	6.87500	13.36932	-21.79935	35.54935
	Equal variances not assumed			.514	7.025	.623	6.87500	13.36932	-24.71559	38.46559

9. If you were making an SPSS data file, how many columns would you need for the following designs? No need to justify your answers.

- A. 2x3 between-subjects analysis of variance
- B. 3-level repeated-measures (within-subjects) analysis of variance
- C. 3-level between-subjects analysis of variance

10. A correlational study found that infants who were fed breastmilk performed better at later cognitive tasks than infants who were fed powdered formula. Here is how this study was described by WDUM, Channel 37 News. After each sentence, indicate "OK" if the statement can plausibly be made from correlational research or "NO" if the statement cannot be made from correlational research. No need to justify your answers.

Scientists found that kids who are fed breastmilk when they are young are better thinkers when they get older _____. Although the study cannot identify which, either something in breastmilk helps brain development or something in formula harms it _____. Regardless, if parents want smart kids, it appears that breastfeeding may be one way to help achieve this goal _____.