

**Psychology 205, Spring 2010**  
**Research Methods in Psychology**  
**Mid-Term #2**

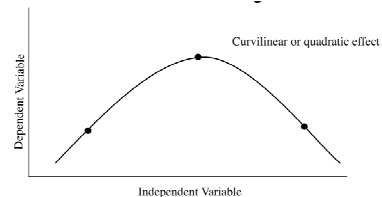
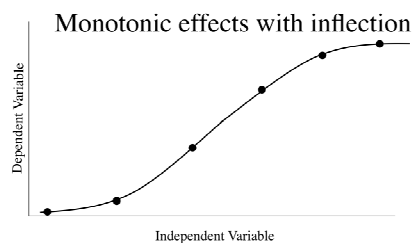
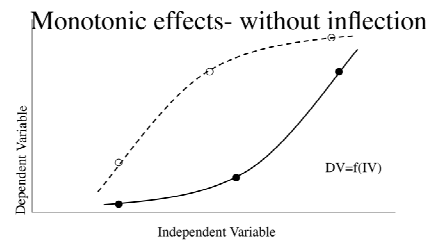
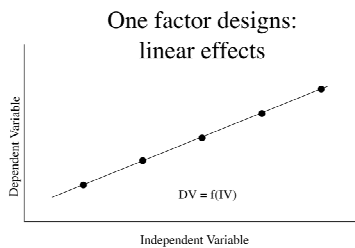
**Name:** \_\_\_\_\_

**Short Answer (14 questions):**

1. How are quasi-experimental designs different from experiments? Why are they used?  
(4 points)

*Quasi-experimental designs are those where random assignment of subjects and/or manipulation of the independent variable is not possible (and internal validity is threatened as a result) (2 points). They are used when random assignment is not possible or ethical (2 points).*

2. Draw three graphs – one showing the linear effect of an independent variable on a dependent variable; one showing a non-linear but monotonic effect and one showing a non-monotonic effect.  
(3 points)



3. When conducting covert observational research (collecting anonymous data without participants' knowledge), what is the rule of thumb regarding the ethical respect of privacy?  
(4 points)

*The observation of people in public places (such as malls and restaurants) is generally not considered an invasion of privacy as long as confidentiality and anonymity are maintained. However this does not extend to circumstances where privacy is reasonably expected (public bathrooms, locker rooms, eavesdropping on private conversations in public places, etc.).*

4. Under what circumstance is the use of deception allowed in research and what is the process by which participants are made aware of a study's deceptive aspects? (4 points)

*APA and federal guidelines only allow deception when the need is justified by the research's potential scientific, educational or applied value (and when the deception is necessary to avoid participant reactivity) (1 point). Even then, researchers are not allowed to deceive participants about aspects of the study which might affect their willingness to participate and the consent form must clearly state the potential risks that such deception might entail (1 point). During or after the experiment, researchers are obligated to inform participants about the details of the study and all deceptive aspects through DEBRIEFING (2 points).*

5. Explain how the publication of research results in scholarly journals contributes to the advancement of science. (4 points)

*In order to be published, results must be reviewed and accepted by academic peers. This process helps to ensure that reported results meet the standards of the academic community and represent unique, significant contributions. After publication, results are accessible to fellow researchers who can test and apply them further.*

6. Explain how paradigmatic thinking is beneficial to researchers. In addition, describe how paradigmatic thinking can be a source of potential error? (8 points)

*Paradigmatic thinking helps researchers in a given scientific discipline by providing a common methodological framework for organization and communication. However, it can also inhibit researchers' ability to see events that do not fit within the paradigm and/or cause researchers to see "non-events" that are predicted by or harmonious with the paradigm.*

7. How does the use of multiple 'pilot studies' threaten the meaning of significant results and what can be done to overcome this threat?  
(4 points)

*Type I error rates will occur, on average, one out of every 20 times. The use of multiple pilot studies before reporting "significant" results increases the probability of reporting an effect when there isn't one present. Replication of results helps to reduce this probability.*

8. Describe two distinct types of circumstances that would constitute coercion to participate?  
(4 points)

*Credit given for examples where (1) refusal to participate would directly or indirectly lead to negative consequences or (2) exceptionally high incentives for participation are given. One good example would be course credit for participation where no acceptable alternatives are allowed.*

9. Define concurrent and predictive validity. What types of studies allow researchers to assess predictive validity?  
(5 points)

*Measures that correlate with specified criterion at the time of measurement have concurrent validity (2 points). Measures that correlate with future behaviors or outcomes have predictive validity (2 points). Predictive validity can be assessed with longitudinal studies (1 point).*

10. Describe two components of construct validity.  
(4 points)

*Two measures of the same construct have convergent validity to the extent that they correlate with each other. A construct is said to have discriminant validity to the extent that measures of that construct do not correlate with measures of alternative constructs.*

11. How is Item Response Theory conceptually different from Classical Test Theory? (Hint: what factors does it take into account?) (5 points)

*IRT takes into account "item difficulty" and "ability of the test-taker" and is better than Classical Test Theory in terms of avoiding the floor and ceiling effects (4 points). One additional point for mentioning either greater efficiency of IRT or issues it poses for anxious test-takers.*

12. What's the difference between nomothetic and idiographic research approaches? (2 points)

*Nomothetic seeks to establish general principles that apply across individuals. Idiographic seeks to describe, analyze and compare the behavior of individuals.*

13. How does the Anscombe data set demonstrate one of the problems with using correlation. (2 points)

*Non-linearity...*

14. Why are subject variables a necessary aspect of psychological studies? Give two examples of stable subject variables and two examples of transient subject variables. (6 points)

*Variables on which subjects do not differ are not variables! Trait variables include: ability; skill/degree of expertise/practice; trait affectivity; motivational interest. State variables include interest and a wide variety of affective and physiological states.*

**Long Answer (5 questions):**

15. Name AND evaluate each of the designs portrayed symbolically below. Note that “X” stands for a **quasi-independent** variable.  
(3 points each; 15 points total)

a)     $O_1$      $X$      $O_2$

*Pretest-posttest design (1 point), which has very low internal validity. This type of design does virtually nothing to eliminate confounds (2 points).*

b)     $X$      $O$   
       $-$      $O$

*Non-equivalent groups with only a posttest (1 point). This type of test fails to evaluate the similarity of the two groups before the introduction of the quasi-independent variable, so internal validity is still very low (2 points).*

c)     $O_1$      $X$      $O_2$   
       $O_1$      $-$      $O_2$

*Non-equivalent groups with a pretest and posttest (1 point). Internal validity is higher than in either of the two previous designs as it provides a baseline and evaluates the groups at time 2. Many confounds are still possible due to a lack of random assignment (2 points).*

d)     $O_1$      $O_2$      $O_3$      $X$      $O_4$      $O_5$      $O_6$      $-X$      $O_7$      $O_8$      $O_9$

*Interrupted time series with a reversal (1 point). In this design, the effects of introducing the variable can be evaluated in light of what happens when the variable is removed at a later time. Though this design is helpful for increasing confidence about the effects of X, it's often not feasible with the use of quasi-experiments (for example, seat belt laws are seldom repealed) (2 points).*

e)     $O_1$      $O_2$      $O_3$      $O_4$

*Longitudinal design (1 point).*

What are the advantages and disadvantages of this type of design?

*Advantages include ability to assess developmental changes, generational and/or cohort effects and ability to assess predictive validity of measures. Disadvantages include difficulty of recruiting and maintaining contact with participants and the need to invest more time and resources (2 points).*

16. What type of reliability is relevant for each of the following statements:  
(2 points each; 8 points total)

a) 4th graders at Oak School took two achievement tests on May 1, 1984. Scores on Mrs. Johnson's "homemade" test correlate .83 with the California Achievement Test.

*Alternate form reliability*

b) On average, items within Mrs. Johnson's reading test correlate .42 with each other.

*Internal consistency or inter-item reliability*

c) Scores for the essay portion of Mrs. Johnson's test correlate .88 across the three teachers who graded them.

*Inter-rater reliability*

d) Scores from the first administration of Mrs. Johnson's test correlate .92 with scores from a second administration of the same test to the same individuals on May 1, 2010.

*Temporal stability or test-retest reliability*

17. (6 points) There are 10,000 men who are 30 years old living in Bakerstown. 5% of them will develop XYZ disease by age 60. 90% of the men who develop XYZ disease will test positive for a specific genetic mutation at age 50. 94% of the men will test negative for the mutation at 50 and will fail to develop the disease by age 60. What are the odds that a man who tests positive for the mutation at age 50 will develop the disease by age 60?

$$450/550 = 9/11 = .82$$

|                  | Test + at 50 | Test - at 50 |        |
|------------------|--------------|--------------|--------|
| Disease at 60    | 450          | 50           | 500    |
| No Disease at 60 | 100          | 9,400        | 9,500  |
|                  | 550          | 9,450        | 10,000 |

*2 points for drawing a matrix with the wrong answer.*

18. (6 points) A prominent pharmaceutical company wishes to test the effects of a new allergy drug, Drug X. They gather a sample of people with a certain minimal allergy level and randomly assign them to one of two conditions: 100 mg of X and a control group that was given no drug. They discovered that the subjects in the drug condition had a significant reduction in allergy symptoms but those in the control group did not. They concluded that Drug X is effective in fighting allergies and should be sold to the public.

What do you think about their conclusion?

*The conclusion is not sound because they did not test for a placebo effect.*

How could this study be improved? Explain.

*They should add a placebo control group. In order to prove that the drug is effective, they would then need to demonstrate that the experimental group improved significantly more than both the placebo and control groups.*

19. (6 points) One study demonstrated an interesting relationship between intelligence and age. WAIS (Wechsler Adult Intelligence Scale) IQ scores were collected from over 2000 subjects. These subjects were divided into age groups of 16-17, 18-19, 20-24 and five-year blocks up to 75 and over. It was found that IQ scores increased slightly from adolescence up into the late 20's, but then begins to decline steadily as one gets older. Assuming that the test was as appropriate for older individuals as younger individuals, and that the participants were equalized for number of years out of school, is it fair to say that intelligence decreases with age based on these findings? Why or why not?

*No, this is not necessarily accurate. This study is a cross-sectional design and does not take into account possible generational/cohort effects, which might include differences in intellectual development due to changes in the educational system (among other things). The best way to test for changes in intelligence due to age would be with a longitudinal design.*