
Psychology 310
Research Methodology

Student Workbook
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Section 1

Important Terms

Key Terms - Midterm

Ch. 1 – Scientific thinking

Applied research vs. basic research
Lab vs. field research
Ways of knowing
Determinism
Attributes of the scientific method
Pseudoscience

Ch. 2 – Developing ideas for research

Scientific loop
Hypothesis
Affirm the consequent
Modus tollens
Developing research ideas
Nature of theory
Falsification
Parsimony (Ockham's razor)

Ch. 3 – Ethics in research

Milgram experiments
Tea-room trade
Developing the APA code
General ethical principles
Major ethical considerations
Types of deception
Deception alternatives
Cost/benefit analysis
IRB
Level of risk
Types of scientific fraud
Detecting scientific fraud

Chs. 4 and 5 Studying/Measuring Bh.

Variable
Scales of measurement (NOIR)
Measure = true score + error
Reliability
Ways to measure reliability
Shared variability (calculation)
Operational definition

Relationships between variables
Nonexperimental vs. experimental methods
Independent and Dependent variables
Assigning causality
Outcome research
Converging operations
Validity
 Construct validity
 Internal validity
 External validity

Ch. 6 Observing behaviors

Naturalistic observation
 Data type and interpretation
 Issues
Negative case studies
Systematic observation
 Methodological issues (reactivity, etc.)
Case studies
Archival research
Accretion measures

Ch. 7 Survey research

Response set
Confidence intervals
Sample size
Sampling techniques
 Probability vs. Non-probability
 Simple random
 Stratified random
 Cluster sampling
 Convenience sampling
 Quota sampling
 Bellweather sampling
Sampling frame
Improving response rate
Double-barreled questions
Negative wording
Push poll
Closed vs. open-ended questions
Likert scale
Interviewer bias

Key Terms - Final

Ch. 8 – Exp. Designs:

Purpose/pitfalls

Confound
Internal validity
Missing control group
Pretest/posttest design
History, maturation, testing instrument decay, statistical regression, mortality, selection
Sensitization
Independent (between) groups design
Matching
Repeated (within) groups designs
Power
Costs/benefits of two design types
Carryover and practice effects
Counterbalancing techniques
Complete, random, Latin Square, reverse order

Ch.9 – Conducting experiments

3 criteria for selecting participants (who, how many, how long)
3 considerations for the independent variable (type, strength and cost)
2 types of manipulations
3 types of dependent measures
Ceiling and floor effects
Converging operations
Demand characteristics
Hawthorne Effect
Placebo group
Wait-list control group
Expectancy effect
Double-blind
Manipulation check

Ch. 10 – Complex Exp. Designs

Reasons for complex designs
Factor/condition/level
Main effect
Interaction
Possible combinations
Graphs of combinations
Mixed factorial

Ch. 11 – Other design types

Program evaluation
Nonequivalent Control Group Pretest-Posttest Design
Non-random (convenience) group assignment
Interrupted Time Series Design
Control Series Design
Reversal (withdrawal) Design
Multiple Baseline Design
Cross-Sectional Method
Cohort effects
Longitudinal Method
Sequential Method

Ch. 12 Correlational Designs

Ways to analyze the results (means, percents, correlation)
Graphing frequency (pie, bar, frequency polygon)
Descriptive statistics vs. inferential stats
Pearson r
Restriction of range
Curvilinearity
Effect Size vs. Statistical Significance
Regression ($Y = a + bX$)
Criterion variable (Y)
Predictor variable (X)
Third-Variable Problem
Multiple Regression (multiple correlation)
Partial Correlation

Section 2

Homework Assignments

Assignment #1 - "Ways of knowing"

Goal

To have you consider how various parts of our society gather knowledge which support their conclusions and decisions.

Task

List in the following matrix, from most to least which "way of knowing" (tenacity, authority, logic, observation, scientific method) each of the following areas use. Provide an explanation (a brief paragraph) for the ranking for each of the five areas.

	Religion	Government	TV ads	Internet	Science
Most used					Scientific method
Least used					

Assignment #2 - “My Life Plan” (Employment version)

Goal

To have you develop a plan for employment which identifies a career, considers your fit for that career, and considers how to get and succeed in the career.

Task

Part 1: Identify a career

- 1) Name the career and describe what you will do every day as part of this career.**

Part 2: Cost/benefit analysis

- 1) Identify 3 - 5 aspects of the career that you think will be rewarding. In other words, why do you want this career?**
- 2) Identify 3 – 5 aspects of the career that might be negative.**
- 3) Briefly analyze if the benefits outweigh the costs**
- 4) Indicate what annual gross salary you will make to start with and after 20 years in this position. What source is this information from? Will this be enough money from you?**

Part 3: Planning

- 1) Identify and describe 3 – 5 actions you can take from now until graduation (B.A.) to prepare you to get this career.**
- 2) Identify and describe 3 – 5 actions you can take *after* graduation to get this career or succeed in the career. So, if you will get this career after you graduate, what will you need to do to “get ahead” in that position.**
- 3) Identify and describe 3 – 5 pitfalls that might prevent you from getting or succeeding in this career.**
- 4) Identify at least one (preferably two) employers for this career and include contact information for hiring personnel (phone number or email) at that employer.**

Assignment #3 - “Ethics”

Goal

Consider alternate research methodologies and explore the drawbacks and benefits of these methodologies.

Task

The Milgram study generated important data, but was filled with ethical problems. If you were to do the research again today and planned to use a procedure similar to Milgram’s, what changes would you need to make to get approval from the KU Institutional Review Board?

- 1) Briefly describe the question Milgram was studying.**
- 2) Explain the benefits and drawbacks of Milgram’s design. Pay attention to the ethical problems in the design.**
- 3) Outline your new research design and explain the difference between your design and Milgram’s design.**
- 4) Explain why your design is more ethically acceptable.**
- 5) Explain if your design adequately addresses #1 above.**

Assignment #4 - "Library Research"

Goal

Gain familiarity with the literature search tools available to psychologists and to use these tools to find and evaluate relevant literature.

Task

Imagine that you are a therapist working in private practice. You are seeing a client who is struggling to cope with parenting a child who has recently been diagnosed with Autism. Your client, who typically comes to sessions appearing depressed and hopeless about her situation, arrives seeming quite happy. She reports that she was reading the newspaper when she came across an article explaining an intervention, Facilitated Communication (FC), used to treat Autism. She hands you the following article:

"Jane is a 13 year-old girl who has spent almost the entire duration of her young life trapped in her own mind, unable to express her thoughts and emotions to anyone, including the parents that love her and want nothing more than to connect with their daughter. Jane has a condition that all too commonly devastates families everywhere and proves to be one of the most difficult psychological disorders to cope with. Jane was diagnosed with Autism at age 3. Throughout her life Jane has been unable to speak, has difficulty navigating her environment and does not connect emotionally with anyone, including her parents and older sister. To the outside observer, Jane lives in complete isolation, without any ability to interact socially. Obviously this condition has completely overwhelmed her parents who have taken her to countless professionals and have tried anything and everything that has been recommended to them, but nothing has worked. That is until 3 months ago when Jane's mother, on the recommendation of a coworker she barely knew, took Jane to see an individual practicing Facilitated Communication (FC). FC is an intervention that allows individuals who are unable to directly communicate to speak to others by typing out phrases on a keyboard with the assistance of a trained communicator. The communicator serves only as an "assistive device," holding the patient's arm and hand to provide the physical support necessary to allow the patient to use a keyboard and type out words and phrases. With this help, the patient, who is normally unable to communicate at all, becomes able to answer questions, hold conversations and express his/her innermost thoughts through typing. In a matter of a few sessions of FC, Jane's mother reports that she began talking to her daughter for the first time in 13 years. She was able to ask her questions, understand her thoughts and feelings and build a relationship with someone that had been locked in her own mind for her entire life. It is discoveries like this that give hope to everyone who suffers or knows someone suffering from a severe illness and reminds us all that there are miracles."

Your client asks your opinion of FC and whether this will be the answer to all her prayers. You tell her that you have never heard of this technique but you will do some research and let her know what you find.

Your task is to research FC and gather information about the effectiveness of FC in the treatment of autism. You will use this information to form conclusions about the overall effectiveness of this intervention and present recommendations to your client about whether or not to pursue FC for her daughter.

Specifically, you will need to complete the following steps:

- 2) Find a total of three articles on the effectiveness of FC, one satisfying each of the following:**
 - a. An article located using a PSYC INFO or Web of Science search**
 - b. A popular press report (e.g., newspaper, magazine, website, etc.)**
 - c. An article/statement describing the official opinion of your profession regarding the use of FC.**

- 3) For each of the three articles, complete the following:**
 - a. Provide a brief summary**
 - b. Identify the source of the article**
 - c. Identify the intended audience**
 - d. Identify the author's/source's qualifications**
 - e. Identify the motive of the article (i.e. what is the author trying to achieve by writing the piece?)**

- 4) Brief your client on your findings.**
 - a. Indicate what information you found**
 - b. Provide your opinion regarding the efficacy of FC, using the information you gathered to support this opinion.**
 - c. Make specific recommendations to your client about how she should proceed.**

Assignment #5 - “Mid-semester feedback”

Goal

To improve this course.

Task

1) For homework assignments 1-4 and Report 1 please complete the following information:

a) On a scale of 1 to 10 (1 being low and 10 being high), rate:

- Assignment was clear**
- Assignment was appropriate for class goals**
- Assignment was enjoyable**
- Assignment led to meaningful class discussion**

b) Name one thing that you liked about the assignment and one thing that could be done to improve the assignment

2) New assignment

Come up with an assignment to replace the assignment you liked the least of the first four assignments. Describe it in about a paragraph.

3) My grade

In a paragraph or less, please describe what I need to do for the remainder of the class to get the highest possible rating on item 8 of the student evaluations: “Overall he is an effective teacher” for this class (a methodology course in a large lecture format).

Assignment 6 – “Surveys”

Goal: Learn to extract critical evaluative data from surveys and evaluate their worth

Below are two surveys of the same topic with different results.

http://www.harrisinteractive.com/harris_poll/index.asp?PID=561

A 70 to 29 percent majority of adults are in favor of a law that would "allow doctors to comply with the wishes of a dying patient in severe distress who asks to have his or her life ended." This is an increase from the 65 to 29 percent majority who felt this way in 2001, but less than the 73 to 24 percent majority who did so in 1993.

<http://www.time.com/time/magazine/article/0,9171,1042442,00.html>

In a TIME poll conducted last week, 52% of Americans surveyed said they agree with the Oregon law, vs. 41% who did not.

- 1) For each survey, indicate**
 - a. The sampling frame**
 - b. The number surveyed**
 - c. The survey method**
 - d. Indicate the “actual question used” for each poll**
HINT! The Time survey will require digging. The information is there but you will have to go to another website. Who did Time use to conduct the poll?
- 2) Why do these poll results appear to differ by such a large amount?**
- 3) Go to “Polling the Nations” in the KU library “Databases” or use some other way of finding polls (internet search, library research)**
 - a. Using “Assisted suicide” as the search term**
 - i. Find three recent polls and report the same data as in Question 1, parts a-d**
 - ii. Report the results of the survey**
 - iii. INCLUDE a link to location of the poll, and a page from the poll report**
- 4) Do Americans favor assisted suicide? Justify your answer with the five polls you have in this assignment.**

Assignment #7 - “Identifying confounds”

Goal

To critically evaluate research and suggest limitations to the internal validity of that research.

81. Groups for Parents

Since we have young children who are occasionally less than perfect in their behavior, we are naturally attracted to studies that deal with behavior problems in children. Groups for Parents is a packaged method that offers parents both a support group of other parents and didactic information on an integrated humanistic behavior modification approach. The authors of “Groups for Parents” (along with a few others) published a study evaluating the effectiveness of their approach in “improving both general child behaviors and individually targeted ones.” They also reported success in increasing the parents’ rates of positive reinforcement along with the rates of compliance in their children.

The method of evaluation was quite simple. Thirteen groups of parents (a total of 277) met once a week for two and one-half hours over an eight-week period. About one-half of the parents had been referred by various community agencies; the rest had heard about the program from friends or other informed sources. The pre- and post-test measures used included a problem behavior checklist (measured by the parents), compliance rates (also measured by the parents), and client satisfaction (self-report). Approximately two-thirds (180) of those enrolled completed the eight-week course.

The data analyses were equally straightforward, consisting of analyses of the differences between pre-and post-test means. Significant results that concern us were reported in the problem behavior checklist, reinforcement rates, and compliance rates. In addition, a very high rate of client satisfaction at the end of the study was reported.

(From “Rival Hypotheses” by S.W. Huck and H.M. Sandler. Harper & Row, 1979.)

Task

- 1) Identify which confound(s) apply to the research below using the six confounds listed in class. (Hint: There are at least 2.)**
- 2) Explain why that confound applies to this research. Describe how the confound may have produced the results found in this research.**
- 3) Fix the research design. Describe what would need to be done to make a confound-free version of this experiment.**

Assignment #8 - “Correlational designs”

Goal: To evaluate, analyze and compare results of correlational research as presented by the media and in scientific form.

The National Institute of Child Health and Human Development initiated a study in 1989 to investigate the relationship between child care experiences and developmental outcomes. More specifically, this study is interested in studying development in children attending day-care compared to development in children under maternal care. This study is still ongoing and data have been released at various time points since it started.

I. INITIAL RESULTS: An initial wave of results was released in April 2001 and sparked controversy. Reports were broadcast across the US (and internationally) presenting the findings.

A. Reaction to Media Reports: The following are 2 links to articles informing the public about this study. Visit the sites and read the articles. As you read, imagine that you are a parent of a young child and you have just come across this information.

- <http://archives.cnn.com/2001/fyi/teachers.ednews/04/19/daycare.aggression.ap/index.html>
- http://www.cbsnews.com/stories/2002/01/31/health/main327633.shtml?source=search_story

Provide a summary of your reaction to these articles as a parent. Include responses to the following:

- What overall conclusion(s) do you draw from these results?
- What statements, data, etc. do you find compelling, and what leaves you feeling skeptical? Why?
- What action, if any, would you take in terms of caring for your child and why?
- What questions do you have for the reporters?
- Is there any further information you would seek out before taking action? If so, what information would you want and how would you go about obtaining it?

II. RECENT RESULTS: Read the article titled “Are There Long-Term Effects of Early Child Care?” (available on Bb) which provides results of the most recent follow-up in this study.

- Describe the basic methodology and main results of the study including:
 - Type of experimental design, main variables, hypotheses, subjects and how they are selected, major findings, etc.
- Are there any confounds that might influence the results?
- What is your reaction after reading this most recent data?

- **What can you conclude about the relationship between child care and development?**
- **Have your original conclusions changed?**
- **What course of action would you take as a parent in terms of raising your child?**
- **What course of action would you take as a scientist in terms of furthering this line of research—how would you address remaining questions, follow-up on these results, etc?**

Assignment #9 - "Factorial designs"

Goal

Identify and understand interactions in experimental designs.

Scenario

Dr. Grobe is trying to determine the best way to help people stop smoking. He conducts an experiment in which he uses both drugs (nicotine gum vs. the nicotine patch) and mood modification (sad movies of dying smokers or funny "Friends" episodes). Half of the participants get to use gum and half get to use the patch. Within these groups, half of the participants get to watch an episode of "Friends" each time they visit the lab, and half get to watch a 22 minute movie depicting dying smokers telling their life stories. The average number of cigarettes smoked per day for a two-week period at the conclusion of the study (the study lasts four weeks), is the dependent measure.

Task

- 1) What type of design is this? What type of independent variables (between or within)?
- 2) Graph the following data set bar graphs.

Avg. cig/day	Mood	
	Sad	Happy
Drug		
Gum	10	12
Patch	10	4

- 3) Provide a description of what the graph shows. A difference of 4 cigs/day is "significant".

Describe all main effects

Describe all simple main effects

What do these results mean?

Assignment #10 - “End of semester feedback”

Goal

To improve this course

Task

1) For homework assignments 6-9 and Reports 2 and 3 please complete the following information:

a) On a scale of 1 to 10 (1 being low and 10 being high), rate:

- Assignment was clear**
- Assignment was appropriate for class goals**
- Assignment was enjoyable**
- Assignment led to meaningful class discussion**

b) Name one thing that you liked about the assignment and one thing that could be done to improve the assignment

2) New assignment

Come up with an assignment to replace the assignment you liked the least of the first four assignments. Describe it in about a paragraph.

Section 3

Research Projects

Research Report #1 - "Territoriality in the parking lot"

Collect your own data using the data sheet made in class.

Staple your own observation sheet to the report

Goal

Form hypotheses, collect data and evaluate outcomes.

Task

Part A

- 1) State an hypothesis regarding how territoriality will interact with parking behavior**
- 2) Briefly describe how this hypothesis was generated. What does it mean? If it is true what are the implications?**
- 3) Operationally define territoriality in terms of this observational study (Hint: what was measured?)**
- 4) Provide a graph of territoriality (as defined above)**
 - a. Plot (bar graph) average time to pull out of a spot for "car waiting" versus "car not waiting conditions"**
 - b. Indicate the number of observations for each condition on the graph**
- 5) Based on looking at the data, was the hypothesis supported? Do you think this would be "statistically significant"? Why or why not?**
- 6) Write a paragraph discussing the limitations of this research project. Do you trust the data? What are the limits of this observational method? What would you do differently if you were to do this as an experiment experiment?**

Part B

- 1) State a new hypothesis of what might influence parking behavior (gender, race, passengers, participant vehicle type). Define how this additional variable was assessed.**
- 2) Briefly describe how this hypothesis was generated. What does it mean? If it is true what are the implications?**
- 3) Provide a graph of territoriality with this new variable**
 - a. Plot (bar graph) average time to pull out of a spot with your new variable**
 - b. Indicate the number of observations for each condition on the graph**
- 4) Based on looking at the data, was the hypothesis supported? Do you think this would be "statistically significant"? Why or why not?**
- 5) Describe (in a paragraph) a "true experiment" that could answer the same hypothesis.**

Research Report #2 - “The Stroop Effect”

Materials

Stroop task website:

<http://faculty.washington.edu/chudler/java/ready.html>

Original Stroop article:

<http://www.psych.yorku.ca/classics/Stroop/>

Stroop history

<http://www.nici.ru.nl/~ardiroel/Rts.htm#JRStroop>

Goal

Form review literature, form hypotheses, collect data and evaluate outcomes.

Task

Part A – Stroop’s paper

- 1) **Use your own words** to describe, in general, what Stroop was trying to do in his experiment. Pay particular attention to the *last paragraph of the Introduction* and the concept of “interference”.
- 2) State this problem as a formal hypothesis. The hypothesis should include the term “interference”. The hypothesis should start “If reading interferes with naming a color, then...”
- 3) Operationally define interference in terms of this experiment. How do we know if interference has occurred?
- 4) Provide a graph of interference
 - a. Take the data from Table VI and create a bar graph. Make a separate graph for men and women. Plot only the Initial Score and Final Score for the NCWd, NC, and RCNd conditions. Ignore the “Gain” and “Percent Gain” part of the Table.
 - b. For each bar, indicate how many total observations there are. You need to know how many subjects and how many trials per condition to make the calculation.
- 5) According to Stroop was the hypothesis supported? How did he make this determination?
- 6) Write a paragraph discussing the limitations of Stroop’s method. Were there any confounds? How could the experiment be improved?

Part B – Internet exercise

1) Go to the Stroop task website:

<http://faculty.washington.edu/chudler/java/ready.html>

Do the basic Stroop task. Write down your times for each version of the task.

Click “Enter and compare your results” for each box (Word Set 1, Word Set 2, and Difference). Scroll down in each window and hit “Submit”. Use the time you wrote down for the graph below.

	Time	Frequency	Percentage
Task 1			
Task 2			
Difference			

2) Write a description of the method employed in this class exercise.

- a. Be specific (like Stroop) – How many trials per condition? What colors were used? Was there feedback?**
- b. What was the task?**
- c. What was the dependent measure? How was it collected?**
- d. What was the independent variable?**

3) What is the hypothesis for this version of the experiment?

4) PsycInfo: How many articles related to “Stroop” have been published in the last 10 years?

Part C – Data analysis

Let’s say we did the on-line experiment came up with these data:

Average time (in seconds) to identify the colors			
Colors/words match		Colors/words mismatch	
Men	Women	Men	Women
8.5	8.2	17.4	17.9
n = 65	n = 78	n = 65	n = 78
“n” = number of participants			

1) Provide a graph of the data. Plot RT only.

2) Was the hypothesis from Part B supported? To determine this, assume a difference of 5 seconds or more is “statistically significant.” (Hint: was gender part of the hypothesis? Of not you may need to eliminate this variable by obtaining an average for the conditions you wish to compare.)

3) This was a within subjects design. How could it be made into a between subjects design? What are the benefits and limitations of each design?

6) What are some problems with this experiment and how might they be solved?

Report 3--Research participation

For research report #3 you will participate in two research studies. Research studies can be found on-line. See <http://ku.sona-systems.com> for more information. The length of each study is not critical. Each study should be from 30 to 90 minutes. It will be important for you to use your debriefing time to ask the researcher questions of relevance for your report.

Staple your credit receipt provided by the experimenter to your report. When you have completed both studies and answered the following questions, you may turn in report #3.

Your task is to participate and then answer some questions about the study. Type these answers on a separate sheet. Your answers should be more than "yes/no" responses. *Briefly* elaborate each answer.

Ethics

Were you provided with a briefing for informed consent?

Did the briefing match the task you did?

Were you debriefed?

Was deception used in the study?

If not then did a lack of deception change your behavior and have an effect on the study?

If deception was used, did it work and how did you feel about it?

Were there any ethical problems in this study?

Experimental design

Briefly describe the task you did in the experiment.

You can ask the researcher to help with the following questions. If the researcher does not know, then indicate that and make your best guess.

What were the dependent and independent variables?

What was the hypothesis of the study?

Was randomization used and if so how?

What is the anticipated sample size?

How will the data be analyzed?

Confounds

What potential problems do you see with this study?

How could they be addressed?