



Scientific Reasoning and Research Design FYC 6800, Section 6075 - Fall 2011

Instructor Information

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Consultation Policy

Office hours are 3-5 p.m. every Monday and Tuesday. However, I will meet with you any time that I am free. The best approach is to send me an e-mail. Please contact me at any time if you have a question or just want to discuss something.

Course Description

This course explores how science generates new knowledge and how to evaluate the validity of research findings and their applicability in your professional work.

Course Goals

The goals of this course are (1) to improve your ability to apply, evaluate and create science based research findings and (2) provide you with the skills needed to use the principles of scientific reasoning to assess claims and information to make decisions in your daily personal life.

Course Objectives

After completing this course, you will be able to:

1. Evaluate the internal and external validity and explanatory power of research;
2. Judge when you can apply research findings in your professional work;
3. Use theory to guide your own research and professional work;
4. Select a valid sample for research and evaluation;
5. Select appropriate ways of analyzing data for research and evaluation; and
6. Develop your own research designs for research and evaluation.

Approach and Expectations

This course will rely heavily on applying the concepts that we address during the course. Devoting time, attention and thought to your assignments is critical to success. I expect you to develop and demonstrate analytical and critical thinking skills during this course. Both are central to science and are prerequisites for using science to develop new knowledge and to apply effectively the knowledge generated by science. We will discuss what the term critical thinking means in more detail early in the course. In practical terms, this means that I am **NOT** looking for rote answers to the questions I ask. Rather, I want to see that you can apply the concepts that we discuss to analyze and evaluate research studies and to develop your own studies either for research or for evaluation.

This is a graduate course. I assume that you have enrolled in this course because you want to acquire the knowledge and skills needed to conduct your own research or evaluation and apply research findings in a professional capacity. I use a combination of assigned readings, self-directed exploration of the literature and classroom activities to try to create an environment in which you can gain the critical skills and knowledge you need. Taking advantage of these opportunities is your responsibility. I expect you to provide evidence in the form of citations in assignments and class participation that you have used the resources, including the texts, my lecture material, our class activities, and materials that you find for yourself, to maximize your learning experience. I base my evaluation of your performance, in part, on the degree to which you provide evidence that you have taken responsibility for your own learning experience and that you are actively seeking out all of the resources possible to make the learning experience as profound and meaningful as possible.

You should read the material in the texts or other assigned readings **before** class. I base my comments in class and the class exercises on the assumption that you already know the material in the assigned readings. Our class activities, including my comments, will build upon and extend your competence in each topical area.

Required Textbooks

de Vaus, David (2001) *Research Design in Social Research*. Sage Publications, London, 279 p.

Nardi, Peter M. (2006) *Interpreting Data. A Guide to Understanding Research*. Pearson, New York, 122 p.

Recommended Textbook

Shoemaker, Pamela J., Tankard, James William, Jr. & Lasorsa, Dominic L. (2004) *How to Build Social Science Theories*. Sage Publications, London, 215 pp. This text covers material from the early part of the course in more detail than we will accomplish in class. It is recommended for M.S. students.

Other Materials

I will provide you with assigned readings from other sources than the textbook. Most of the additional required readings for the course consist of research journal articles. Some are chapters of books of mine that I have placed on e-reserve. If you do not know how to get materials from e-reserve, consult the UF libraries website for instructions. I also provide a list of suggested readings for most topics. These will be useful in completing the assignments.

Grading Philosophy and Policy

I award grades not to punish poor performance, but rather to help you understand and master the material we are covering. My goal is for every student to earn an A in this course. I expect to see increased comprehension and dominance of the concepts and ideas that we discuss during the course. I will therefore continually adjust my expectations of your performance. Expectations grow as the semester progresses and what was an acceptable or adequate response on an early assignment will most likely not be acceptable on a later assignment. I will expect to see increasing sophistication in your answers. If my work load and time permit, I will usually allow students to re-submit one or two assignments where performance was poor. However, my time may not permit this and this does not mean that you can routinely turn in poorly completed

assignments, get my comments, and then re-submit the assignment to improve your grade. I apply this policy at my discretion when I feel that a student sincerely did not understand the material and when, in my evaluation, performance on a specific assignment was below the norm for the student due to this lack of understanding.

Most of us learn more effectively when we can discuss our ideas with others. I encourage you to engage in collaborative learning. We will have three assignments where you work in groups. However, I encourage you to work together as much as possible. Share your ideas and discuss the assignments with some of your colleagues. I want to see the product of your individual work, but I want you to maximize your learning experience by collaborating in the learning experience with others. Sharing materials about research design is one very good way to learn collaboratively.

Late Submission Policy

The assignments in this course are sequential. Understanding the nature of theory-based research, for example, is critical to understanding how to evaluate the quality of the research question. You therefore need to complete assignments in a timely manner and in order. I will not accept assignments submitted after the due date and I will award zero (0) points for the assignment. All due dates are given at the class web site.

Grading Criteria

I list the specific criteria that I will use to grade each assignment at the end of the assignment. I strongly encourage you to read those criteria and respond to the assignments based on the criteria. I use the following general kinds of criteria in evaluating your performance on assignments.

Ability to apply the concepts learned in class. I expect you to apply the concepts that we learn about in class. You must demonstrate that you understand the key concepts and that you can use what you have learned. Concentrate on applying the concepts, not on repeating phrases from our discussions or from the literature. Show that you remember, understand, and can apply what we have learned.

Complete answers to specific questions. I ask a number of specific questions in each assignment. I have tried to make these as clear as possible and to give you guidance about how to answer each question. Be specific and make sure that you answer each question completely. **Include a thorough justification or explanation for each answer.** I am more interested in how you arrived at a conclusion than in whether I agree with your conclusion or not.

Evidence that you are searching out and reading additional materials about research design, beyond the assigned readings. In a graduate course, the assigned readings are a place to **start** your exploration of a subject. I expect you to seek out and read additional material about research design as the semester progresses. For example, when we discuss sampling, you should find published information about the uses, strengths and weaknesses of different sampling approaches. I expect you to refer to the materials that you find on your own in class (this is part of your class participation grade, too) and in your assignments. Cite these materials in your assignments and include them in the references.

Improvement. I do take your overall progress during the semester into account in determining the final grade. My concern is that you master the material over the course of the semester, not

necessarily on your first attempt. Please do not become overly concerned if you receive a poor grade on an assignment. For example, you might perform poorly on the assignment dealing with the research question. That's not good, but if I see that you have well formulated, theory-based research questions in the last assignment, I will "discount" your poor performance on assignment 3. You didn't quite get it the first time – but you got it. That is our objective.

Where to Find Reference Materials

The first part of this course focuses on learning to find, read, understand and analyze the published research literature. The latter half of this course focuses on creating research designs – using what you have learned. The designs can be for either something like a thesis or dissertation, or designs to evaluate a project. In either case, you will have to base your proposed research on a theoretical framework and on the existing body of knowledge. I also expect you to find and use published literature about research design in completing the assignments. Finding reference materials in your area of interest and about research design considerations is therefore critical to success in this course.

Most disciplines support several journals. You need to learn to use **research journals**. Many journals report research, but there are important differences between them in terms of the audience for which they are intended. A research journal means just what it says. The primary audience for the material is other researchers and well educated professionals. These are the journals that you will have to use throughout your graduate experience, and your employer after graduation will expect you to be know these journals in your area of expertise and use them regularly. Whatever your undergraduate experience, relying on popular web sites is **not acceptable** in graduate school or in the professional work world. Even among research journals, the scholarly value of the material they contain varies. High caliber research journals are internationally recognized. They are always thoroughly peer reviewed. They report original research findings. In fact, most have a policy that they will not publish information that has been previously published somewhere else. They provide an in-depth description of how the research was conducted, how the data were collected and analyzed, and the findings of the research. Both non-profit (professional societies mostly) and for-profit presses publish very good research journals. Most professional societies and for-profit publishers also produce journals for practitioners. They, too, are normally peer reviewed, but they are often – not always – less scholarly in nature than the high caliber research journals. They often focus on the recommendations that grow out of research, but do not provide a detailed description of how the research was conducted and the contribution of the research to new knowledge and theory. Other journals are aimed at the general public. You should not rely on these publications.

How can you identify a research journal? First, you can always consult with me or other faculty members in your area of interest to identify appropriate journals. However, you need to develop the ability to judge the quality of journals yourself. There are several characteristics that distinguish between different kinds of journals. First, in high caliber research journals, the majority of the articles will report original research results. Opinion pieces, review and the like will be of minor importance in the overall content of any given issue. Second, the articles will be aimed at a sophisticated reader. You can see this by the use of technical terms, for example. Perhaps most telling, research reports in these journals carefully explain, in a detailed way, how the research was conducted. They let you know exactly what steps the researcher took to collect data. They include a very meticulous analysis of the results. Again, they explain exactly how the research analyzed the data. Third, the research reports focus on the research and what was learned -- **not** on recommendations for how to apply or use the findings. Finally, the description of the journal (somewhere near the very front) will give clear clues. Look for words

like scholarly, the highest standards, and international interest. In my discipline, geography, the Association of American Geographers (AAG) publishes two journals. The first, the *Annals of the American Association of Geographers*, is a research journal. Here is how the AAG describes it:

“The Annals of the Association of American Geographers publishes original, timely, and innovative articles that advance knowledge in all facets of the discipline. Papers accepted for publication must meet the highest standards of scholarship, address significant research problems and issues, interest the broad readership of the journal, and be attuned to the sensibilities of a diverse scholarly audience.”

Lower caliber journals, on the other hand, do not aim their material at such a sophisticated audience. The audience might be the family practice doctor rather than the doctor at Shands; the school camp counselor rather than the professional whose work focuses on interventions for problematic adolescent behaviors; the field staff member in a community-based organization rather than the professional who develops, implements and evaluates programs for the organizations. Articles in the lower caliber journals often provide only a very brief description of how the research was conducted. The section about data analysis is usually not very lengthy or well developed and the results themselves are often reported in a very summarized form. Often, there is little or no discussion of how the data were analyzed. These journals focus on recommendations for applying research findings, not on the research itself. They do not provide enough information for you to make an adequate evaluation of the degree to which their findings are justified or the degree to which they can be applied outside the context in which the study was conducted. *The Professional Geographer* is a fairly “low caliber” journal. Here is what AAG says: “[*The Professional Geographer*] publishes short articles on academic or applied geography, emphasizing empirical studies and methodologies, as well as book reviews. These features may range in content and approach from rigorously analytic to broadly philosophical or prescriptive.” *National Geographic* is an example of a general interest journal in geography. It’s audience is the general public, not professionals.

Grading Scale

| | | | | | |
|-----------|-----------|-----------|--------|-----------|--------|
| A | 95 – 100% | A- | 90-94% | | |
| B+ | 87-89% | B | 83-86% | B- | 80-82% |
| C+ | 77-79% | C | 73-76% | C- | 70-72% |
| D+ | 67-69% | D | 63-66% | D- | 60-62% |
| E | <60% | | | | |

Distribution of Grade

| | |
|-----------------------------------|-------------------|
| Class Preparation & Participation | 20 points |
| Individual Assignments | 120 points |
| Group Assignments | 40 points |
| Peer Evaluation | 20 points |
| Total Points | 200 points |

Class Preparation and Participation. I will assign a score twice during the semester. I expect you to participate actively and positively in classroom activities and to demonstrate through your comments and participation that you have prepared for class. There is a learning guide for each week. It includes a set of questions that you should be able to answer prior to coming to class for the most part. I encourage you to consult the guide prior to class to make sure that you are prepared and to ask questions if you find that there are areas where you have problems. I

indicate other specific preparation for class for most weeks. Consult the web site carefully to make sure that you complete these preparations.

Finding, consulting, citing and using published material about research design is an important part of your grade in this course. Use of the research design literature – beyond required materials – is an evaluation criterion on most assignments. I provide a list of suggested readings for most topics. You will probably find some excellent materials on your own, too. By sharing this information with your colleagues, you will let your colleagues know about materials that may be of use to them and if your colleagues reciprocate, you will have additional information, too. There is a one-page form called “Sharing Materials” you can use to share materials.

How to Complete the Form. Your objective is to provide your colleagues with a clear, concise description of the major points in the article *about research design*. Focus on what you learned about the specific aspect or topic of concern. You can use any kind of article – research reviews, methodological discussions, published literature about a specific topic of concern like sampling, and research reports. Remember to focus on what you learned about research design, **not** the results of the study itself, especially if your review is of a research report. For example, you might find a good discussion of some of the problems with referral (snowball) sampling in a research report about teenage sex workers. Perhaps the authors discuss the problems they encountered in some detail and that gave you insights into a sampling issue. Do not focus on the research question, the data that they collected, etc. Focus on what you learned about sampling. Be brief. You are giving your colleagues a “heads up” about a good source of materials about research design. They have to decide if they want to consult the material or not. Limit your comments to one page maximum. Send the one-page form to me. I will redistribute your comments to the class as a whole. Put your last name and “sharing materials” in the subject line of the e-mail. Make sure you put your name on the document, too.

Assignments. You will complete most assignments individually, but two assignments are group assignments. I provide learning objectives for each assignment and a list of the criteria that I will use to evaluate your performance on the assignments.

Make sure you follow these general instructions when you submit assignments.

1. Submit a Word document by e-mail. Follow instructions for the file name of the Word document and the subject line in the e-mail.
2. If instructed, attach an electronic copy of the article(s), to the assignment. Use the PDF version of the article – not an HTML version.
3. Number all responses so that I can track which question you are answering.
4. I prefer that you use the APA style, which is **required in the FYCS Department**. If your department uses a different style, such as the MLA style, you may use that style. Please inform me on the first assignment of any style that you are using other than APA.
5. Provide a full reference for the materials that you consult to complete each assignment.
6. Use correct citations within the text of your responses to my questions. If you do not know when you need to provide a citation, consult the APA (or other approved) style manual. For example, if you directly quote an author, you must cite the author, year and page number. If you state an author’s idea (e.g., Jones argues that), you must provide a full citation.
7. When you acquire articles through the University of Florida e-library, **always use the PDF version**. This is the only way you can possibly make correct citations to specific pages in the article. The HTML versions do **not** have page numbers.

8. Communicating clearly in a written format is an important professional skill. Use spell check. Check your documents for grammar errors, etc. Write in the active voice. Avoid long, complex sentences. Read your answers and make sure that they are clear, concise and understandable. I have only your written work to evaluate your performance.

Peer Evaluation. Your peers will evaluate your contribution to the group effort for completing Assignments 3 and 4.

| # | Title | Due Date | Points |
|----|---|----------|--------|
| OP | Identifying Research Journals & Understanding Research Reports – <i>Optional for Doctoral Students</i> | Aug. 29 | (10) |
| 1 | Theoretical Basis of Research | Sept. 12 | 20 |
| 2 | The Research Question | Sept. 19 | 20 |
| 3 | Sampling (group assignment) | Oct. 10 | 20 |
| 4 | Analysis (group assignment) | Oct. 24 | 20 |
| 5 | True or Quasi-experimental Design | Nov. 7 | 40 |
| 6 | Longitudinal, Cross-sectional, or Case Study Design | Nov. 28 | 40 |

Optional Assignment: Identifying Research Journals & Understanding Research Reports
*This assignment is **OPTIONAL** for doctoral students; **REQUIRED** for masters students.*

You must learn three skills to succeed in this course and more importantly to succeed in your graduate studies.

First, you need to learn to identify research journals and specifically articles in those journals that report original research. You will use **research journal articles** for all assignments in this course. If you are confused about what constitutes a research journal, read the Syllabus. It gives you pointers about how to distinguish between types of journals based on the audience they serve. Professionals with advanced degrees use primary sources of information -- the research report -- not information aimed at a popular audience. You have to do this to survive graduate school and your employer will expect you to be thoroughly familiar with and capable of using research reports when you get a job after graduate school. Do **not** use journals or other sources of information directed toward a general public audience for this course. Do **not** rely on web sites and other internet sources for information. With a few exceptions, these are not acceptable sources of information for professionals with advanced degrees, nor are they acceptable reference materials for graduate courses. The only common exception is that professionals do use data banks available through the internet, usually data banks provided by government agencies or professional societies.

Second, you must learn how to find research journal articles that address topics of interest to you. If you do not know how to use the library electronic journal search programs, learn how to do so. Take the time **now** to learn this skill. If you do not become an adept user of the engines that search the research journal databases, you will waste many hours in this course and many more hours over the course of your professional career. Academic Search Premier is the recommended database, but there are many alternatives available through the UF Library System. If you need help learning how to search these databases, make an appointment with the social science research librarian. She is very good and can help you a great deal. You can chat with the librarian by going to www.uflib.ufl.edu/ask/. You can call the humanities and social sciences librarian at 352-273-2665. If you plan to use your home computer to find materials during your graduate program, you need to establish off-campus access to the library. Go to the

library home page (www.uflib.ufl.edu) and click on “off campus access” under services. The process is self-explanatory. If you do not set up an off-campus account, you will not be able to access the research journals that the UF library system provides or you will have to pay for them. All of the required readings for the course are available to UF faculty and students.

Third, you have to learn to read research reports efficiently. The first step is to learn to read, understand, and use the abstract to decide whether you need to look at the full article or not. The second step is to learn to identify the key components in the research report and be able to understand and analyze the contents of the report.

Objectives: After completing this assignment, you will be able to

- Identify journals whose primary audience is researchers
- Identify research reports
- Use the abstract to decide whether you want to read the full journal article
- Identify the key components in a research report
- Understand the content of the research report

Components in the Assignment

1. Select a topic of interest to you.
2. Find **five** high quality research reports about this topic, each from a different research journal. Use only research reports for this assignment. Read the part of the syllabus about finding reference materials for this class if you do not know what this means.
3. Make sure that at least one of the reports uses statistical data analyses and that at least one does **not** use statistical data analyses (e.g., uses qualitative data analysis techniques).
4. Complete the “Abstract Evaluation Form” (available at the web site) for each article. Use your evaluation form to decide whether the article is appropriate for completing this assignment and of interest to you. You need a report of original research with considerable detail. Review the rest of this assignment now so that you know what you need.
5. Submit all five completed abstract evaluation forms in a single Word document by e-mail. Give the document the file name ***YourLastName_6800_OP_Abstracts***
6. Use your abstract evaluations to select two articles from the five research reports that you identified. Select **one** article that uses quantitative data analyses (statistical tests) and **one** article that uses qualitative data analyses.
7. Complete the appropriate form at the course website for each article: “Reading & Understanding Research Reports that Use **Quantitative** Analysis” or “Reading & Understanding Research Reports that Use **Qualitative** Analysis.” **Maximum length 2 pages.** Submit the completed forms by e-mail. Give the documents the file names ***YourLastName_6800_OP_Quantitative*** and ***YourLastName_6800_OP_Qualitative***
8. Use the following for the subject line in the e-mail: ***Your_Last_Name_6800_Optional***

| Assessment Criteria | Possible Points | Your Points |
|--|-----------------|-------------|
| Followed instructions | 10 | |
| Correct APA citations | 15 | |
| Identified research journals | 15 | |
| Identified original research reports | 20 | |
| Identified the key components in the report | 20 | |
| Demonstrated an understanding of the contents of the research report | 20 | |
| Total | 100 | |

Assignment 1: Theoretical Basis of Research

Objectives: After completing this assignment, you will be able to:

- Identify the published research and other academic literature that describes and explains theoretical frameworks used to understand human social structures and processes
- Identify, explain and illustrate the constructs and proposed linkages in a theory
- Compare and contrast how different epistemological approaches use theory to guide research and practice

The development of most contemporary social theory grows directly or indirectly from the work of some early, seminal thinkers – sometimes called the classical social theorists. The reading from *Living Theory* provides an overview of the work of four of these theorists and the reading from Allan provides an overview of two other key contributors, Gilman & DuBois. You need to be familiar with the key ideas of these people because they form the cornerstones of many, if not most, contemporary theories. The Allan book also provides in-depth discussions of ten contemporary groups of theories. Look at the website for Theories of Community Development (line at my home page) to see a list of these. If you want to examine some of them, let me know and I will provide some information. The additional materials at the Theories of Community Development website for each week provide examples of mid-range theories in each group and examples of research based on these mid-range theories. Those readings may help you with this assignment. Mid-range theories are more concrete or specific than the general theoretical frameworks on which they are based. Researchers and practitioners usually work with mid-range theories rather than the broader theoretical frameworks described in Allan. Social learning theory is a mid-range theory based on exchange theory. It deal with a specific kind of behavior – how people learn. This is a typical example of the relationships between a mid-range theory and a broad theoretical framework or group of theories. Exchange theory provides an explanation of the role of social exchange in society in general. Social learning theory applies this theory to a specific aspect of human behavior – learning. In this assignment, you must identify **at least three** mid-range theories that other researchers have used to explore the topic or intervention of interest to you. Select contrasting theories. You will select **one of these theories** as the basis for your work this semester. Spend enough time on this assignment to find a theory that actually interests you and that you can use as a basis for the remaining assignments in this class. Finding a theory (or theories) that interests you **now** will permit you to complete future assignments more easily and save you a lot of time over the course of the semester.

This assignment prepares you for the two final assignments in this class, which involve creating two different research designs. You can base the last two assignments on either thesis or dissertation type research or on a program evaluation. Should you decide to develop designs for evaluating programs, you can base the assignments on an existing program or intervention. However, it may be difficult to tailor your assignments to an existing program or intervention because many are **not** theory-based, or at least do not have a clearly articulated theoretical basis. One of my objectives in this course is to make sure that you understand the relationship between theory and research, so this is an important component of this course. Therefore, you need to make sure that the program you are considering has a theoretical basis. Review the literature and information available about the program and talk to the people involved. If they cannot give you a good explanation of the theoretical approach for the program, do not move forward. It will just be a frustrating experience for you. Dr. David Diehl in the FYC Department, an evaluation specialist, has also indicated that he would be willing to try to help you find some programs that would be good candidates for completing these assignments. You can also simply develop your own ideas for what a theory-based intervention would look like in a program

designed to address the need, problem or issue that you identify in Assignment 3. If you do elect to take an evaluative stance for your work, you need to identify the program or intervention before completing Assignment 3 so that you can select theories that are relevant to the program you have selected.

Use published research reports, “think” pieces, research reviews, textbooks, and other academic sources to learn about **mid-range social theories**. **Research reviews** will be especially useful. I have included a Guide to Reading Research Reviews at the web site. I strongly encourage you to use this guide, which is similar to those for reading research reports, as you complete this assignment.

Make sure that you do **not** confuse a concept or construct like social capital or personality type with a theory. See pages 69-74 of Crix, for example, for a discussion of social capital. It is a **construct** in several theories, but it is not a theory.

Do **not** pick a topic (like child abuse or community-based conservation). Theories are not about topics. They are about human behaviors, social processes and social structures, and the same theory will provide a basis for understanding behaviors, structures and processes in many different settings, with reference to many different topics, or with regard to many different situations. For example, the theory of planned behavior is equally useful for understanding women’s decisions about breast-feeding, youths’ decisions about joining gangs, and college students’ decisions about what major to select. There is no theory of “deciding to smoke.” There are several theories of decision making that can help us understand the decision-making process in general, including the decision to smoke. Do **not** pick one of the grand theories.

Do consult, use, cite and reference additional materials about research design beyond the required readings in responding to this assignment. Using resources about research design beyond those that we cover in class in these assignments is an important course requirement. I am giving you one perspective. The published literature about the topics that we cover in this class will provide you with additional perspectives and with a greater depth of understanding of the topics that we cover. In this assignment, for example, you may want to look at additional literature that discusses the role of theory in scientific research and the literature that deals with the relationship between epistemology and the role of theory in research. I have tried to help you with this requirement for this assignment.

I have provided three kinds of materials that may be of use in meeting the evaluation criteria (listed below) for this assignment. On the web page for this week you will find lists of: (1) appropriate articles that discuss the role of theory and epistemology in research, (2) examples of research reports that have a good theoretical basis, and (3) examples of articles that students in the past have found very useful in seeing how theory is used to guide research.

Answer the questions below. Number your response to each question. Include an explanation or justification for each answer. Be specific in your answers. Use the following as the subject line in the e-mail and as the file name for the Word document: **YourLastName_6800_A1_Theory**

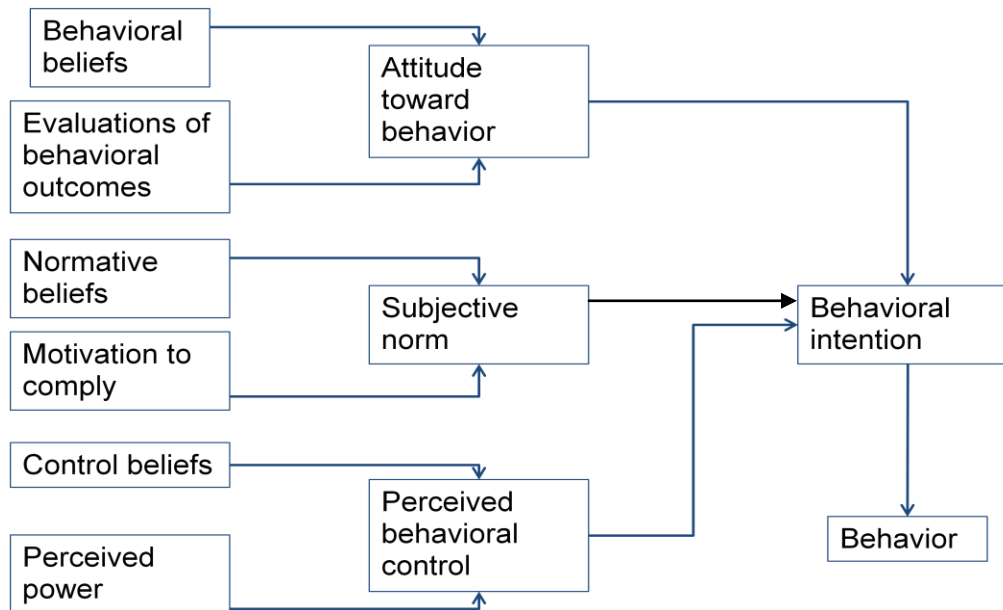
1. Most research, including theory-based research, grows out of the researcher’s desire to solve a problem, issue or need or provide knowledge needed by practitioners. What problem or need for knowledge do you want to address? For example, one of my students was concerned with how we can get people to behave in more environmentally responsible ways. Provide justification that the problem is a significant one that merits attention. Use the **published literature to document the extent and seriousness of the problem**. (1/2 page maximum)

2. Identify and list **at least three theories** that other researchers and practitioners have used to address this problem. Summarize the key constructs in each theory and the linkages between them. (1 page maximum)
3. Provide examples from the scholarly literature of how people have used each theory to inform research and practice relevant to the need, issue or problem you have identified. Consult, use, cite and reference **at least five** sources of information for each theory. **At least two of the five** must be research reports. (6 page maximum)
4. Compare and contrast the strengths and weaknesses of the three theories for exploring the problem or need you have identified. For example, assume your topic is binge drinking by college students. You could explore the theory of planned behavior, the social influence and interpersonal communication model, and the social networks model to try to understand why college students engage in this behavior. You might decide that the theory of planned behavior has a drawback because it does not include peer interaction (although it does include peer norms) as a construct. This is quite different from both the social influence and social network models, which do include peer interaction. (3 page maximum)
5. Select **at least one** theory to serve as the basis for your work this semester. I recommend that you complete the steps 7 and 8 step for the other theories because you may decide to compare and contrast two theories or to extend “your” theory by combining constructs from other theories into it as you develop your actual research designs. For example, you might decide that the theory of planned behavior is a “good” one for your problem or need, but feel that it has shortcomings because it does not include any aspect of social exchange. You might therefore decide in your research to “add” a social exchange component to this theory. Submit only the theory you have selected. (0.5 page maximum)
6. Summarize in your own words the key concepts or constructs in a table format. See the example below of the theory of planned behavior. Make a separate table for each theory and label it. (1 page maximum)
7. Draw a conceptual map (diagram) of the theories. You can submit a scanned hand-drawn document if necessary. See the example of the theory of planned behavior. (1 page maximum)

| Assessment Criteria | Possible Points | Your Points |
|--|------------------------|--------------------|
| Followed instructions, including using APA style | 5 | |
| Identified three mid-range theories of relevance to the problem or need | 15 | |
| Consulted, cited and referenced academic literature showing how the three mid-range theories have been used to inform practice and research about your topic of interest | 15 | |
| Provided a detailed conceptual map of the major constructs and relationships between them in one of these theories | 20 | |
| Provided a definition of each major construct in one of these theories | 20 | |
| Applied the concepts discussed in class and covered in course readings; used, referenced and cited relevant literature about the role of theory in research | 25 | |
| Total | 100 | |

Theory of Planned Behavior

| Summative Constructs | Primary Constructs | Definition |
|------------------------------|----------------------|---|
| Attitude toward behavior | | Overall evaluation of the behavior |
| | Behavioral belief | Belief that behavioral performance is associated with certain attributes or outcomes |
| | Evaluation | Value attached to a behavioral outcome or attribute |
| Subjective norm | | Belief about whether most people approve or disapprove of the behavior |
| | Normative belief | Belief about whether each referent approves or disapproves of the behavior |
| | Motivation to comply | Motivation to do what each referent thinks |
| Perceived behavioral control | | Overall measure of perceived control over the behavior |
| | Control Beliefs | Perceived likelihood of occurrence of each facilitating or constraining condition |
| | Perceived Power | Perceived effect of each condition in making behavioral performance difficult or easy |
| Behavioral intention | | Perceived likelihood of performing the behavior |
| Behavior | | Actual observed or reported behavior |



Assignment 2: The Research Question

Objectives: After completing this assignment, you will be able to

- Identify and interpret the research question in research reports
- Analyze and explain how the research question is related to the author's theoretical framework
- Identify and interpret the author's working or research hypothesis

- Identify and interpret the author’s statistical or formal hypothesis
- Analyze how the variables in the specific study relate to the constructs and linkages in the theoretical framework
- Evaluate the degree to which the research contributes to theoretical understanding and to solving problems, issues or needs

Use **one** of the research reports that you consulted for Assignment 1 to complete this assignment, preferably the one that seems most interesting to you in terms of the kind of research question you are thinking about asking. Use the following as the file name for the Word document and as the subject line when you submit: ***YourLastName_6800_A2_Question***. Include a copy of the article that you used for this assignment with your report.

1. Most research, including theory-based research, is motivated by the desire to solve a “real world” problem or provide knowledge needed by practitioners. What problem or need for knowledge motivated this author’s research? Describe the problem or need in your own words. (Maximum 0.5 page)
2. Research questions, on the other hand, ask about what we need to **know or understand** to be able to address a problem, need or issue. Research questions are theoretical and deal with something we do not understand or know. State the research question(s) in your own words. (1 page maximum)
3. As we discussed in class, many researchers have a “research” or “theoretical” hypothesis or a proposition — a general idea about what they expect to observe, based on the theoretical framework that they are using. Research or working hypotheses deal with the anticipated relationships between constructs in a theory applied to a specific topic. Some authors explicitly state the research or theoretical hypothesis: “We expected that peer influences [a construct] would strongly influence the decision to smoke [a topic].” Others state it vaguely: “The proposed relationships between peer influence and behavior ...” Others do not state it at all. You have to figure it out for yourself. Does the author state a theoretical or research hypothesis or proposition? If not, figure it out for yourself. State the theoretical or research hypothesis or proposition in your own words. (1 page maximum)
4. Look at the model and the table of constructs that you made in Assignment 1 for the theory used in this research. (2 page maximum)
 - a. (a) What constructs of the theory does the research address?
 - b. (b) What causal linkages does it explore? State these in terms of the theory, not the specific topic. For example, the **theory** of planned behavior states that subjective norms strongly influence normative beliefs, which in turn affect our decisions to engage in specific behaviors. A specific research article may examine how peer influences affect young people’s decision to smoke. This is the **topic** of the research. The theoretical constructs examined in this article are subjective norms, normative beliefs, and behavior. The proposed relationships examined are the effects of subjective norms on normative beliefs and, in turn, on behavioral decisions.
5. A specific study is, in essence, the application of a theory (or sometimes more than one theory) to a specific topic and a specific context (place, sample of people, time). A study deals with specific **variables**. The variables represent or “stand for” the constructs in the theory. For example, in the smoking article, the authors examine three constructs – subjective norms, normative beliefs, and behavior. They might use items like the number of

friends who smoke and whether peers see smoking as a sign of maturity to create a variable called “peer approval of smoking” to represent the construct subjective norms. They might use items like frequency and length of time since an individual started smoking to create a variable called “smoking behavior.” What specific variables did the authors use in this study? Make a list of the constructs that you identified in your response to question 4. Under each construct, list the specific variables that represented the construct. Indicate the level of measurement that the author used for each variable. (1 page maximum)

6. Some authors also have a formal or statistical hypothesis (or several). The formal hypothesis is a statement of the relationships between **variables** that the researcher expects to observe. For example, in the smoking study, a formal hypothesis might be: “Peer approval of smoking will be positively associated with smoking behavior.” Does your study include a formal or statistical hypothesis? If so, state it in your own terms. (1 page maximum)

7. A robust research question permits the investigator to contribute to the development of the theory. The question builds on what we already know, often by examining the theory under new conditions, with a new group, or with a new topic, by testing components or causal linkages in the theory that are not well established or understood, or by helping resolve areas where there is confusion or disagreement in the interpretation of the theory. How does the research in this article contribute to theory development? Indicate **which one** of the following four common kinds of contributions to theoretical development the author relied upon. These are four common ways that research contributes to theory. There are others, but you do not need to consider them. Select the primary approach used by the author. Explain and justify your answer. (2 page maximum)
 - a. Some research tests a theory. This is particularly useful with recently developed theories. Usually, a theory has to “prove itself” in a number of tests before it is accepted by the scientific community. Testing new theories is therefore very important, but interest in testing generally declines as a theory becomes more widely recognized as having explanatory power.
 - b. Comparing the explanatory power of two or more theories is another common approach. In fact, this is often follows testing as we try to decide which of several competing theories is best. For example, we might have two or three theories that are generally recognized, with different researchers arguing that one or the other has better explanatory power. Research that tests the theories with the same population helps us decide which is more robust.
 - c. Building or extending theory is a very common objective for researchers. One of my students took a theory commonly used to explain environmental behavior and added constructs from other, related behavioral theories to it. Her objective was to generate a more explanatory theory – one that does a better job than the original of explaining the behavior of interest. The basic theory of the environmental behavior model is used to explain learned behaviors in many settings. Therefore, her theoretical contribution is not just to explaining responsible environmental behavior, but rather has the change of contributing to our understanding of learned behaviors in general.
 - d. Finally, researchers may want to test the degree to which a theory is universally applicable. This involves taking a theory that has shown good explanatory power with some populations, or in some contexts, and applying it with a different population or

under a broader range of conditions. Piaget conducted his early work dealing with the development stages of children, for example, with children from Europe and North America. Later researchers wanted to know whether the stages of development that he proposed were culturally specific, or whether they occurred for all children. They therefore tested his theory with children from many widely differing cultural backgrounds.

8. Refer to your answer to Question 1. How does this research contribute to solving the “real world” problem that incited the author’s interest in conducting this research? (0.5 page maximum)

| Assessment Criteria | Possible Points | Your Points |
|--|-----------------|-------------|
| Followed instructions, including full APA citations and references | 10 | |
| Selected an appropriate research report for review and demonstrated a good understanding of the content of the report | 20 | |
| Provided complete, specific answers to all questions in your own words | 20 | |
| Applied the concepts discussed in class and covered in the required readings in answering the questions; demonstrated that you understand the material that we have covered by using examples and explaining how you reached conclusions | 30 | |
| Consulted, used, cited and references additional materials about the development of research questions and the way that research questions are formulated and used in research; included literature that addresses how the nature of the research question varies depending on epistemological perspective | 20 | |
| Total | 100 | |

Assignment 3: Sampling (Group Assignment)

Objectives: After completing this assignment, you will be able to

- Explain the sampling procedures used in research reports
- Determine whether the researcher wants to generalize his/her **specific findings** to a group of people larger than those included in the sample
- Determine whether the researcher wants to test or build theory (e.g., generalize the conclusions rather than the specific findings)
- Evaluate the degree to which a given sample is adequate for generalizing **findings** beyond the participants
- Evaluate the degree to which a sample is adequate for theory testing or building

This is a group assignment. You will analyze two assigned articles. Your grade will be a group grade. You will receive a peer evaluation of your contribution to the group project. Turn in two documents, one for the article from List A and one for the article from List B. Put all team members’ names on the Word document. Use the following file name for the document and as the subject line in the e-mail: **LastName1_LastName2_LastName3_6800_A3_SamplingListA** or **LastName1_LastName2_LastName3_6800_A3_SamplingListB**

Components in the Assignment

1. Each member of the group should develop a flow chart for each article. I have provided an example of a completed flow chart (Flow Chart Example) at the course website. Use the

Flow Chart Template at the website to develop your flow chart. For Assignment 3 (sampling), fill out the columns on pages 1 and 2 of the template (from research question through data collection). Compare your individual flow charts and develop a single group flow chart that represents your group's consensus for each article. Turn in the **group** flow chart with this assignment. Do not try to complete the data analysis, results and conclusions columns on page 3 of the template at this time.

2. State the research question(s) in your own words.
3. State the theoretical or research hypothesis or proposition in your own words.
4. What theoretical constructs does the research address?
5. What was the **theoretical population** for the study? Put another way, define or describe the population to which the researcher wants to apply the findings. Even when researchers do not want to generalize statistically, most do want to contribute to theory. Therefore, they normally have to make sure that the sample adequately represents the population of interest. For example, if a researcher wants to examine the theory of planned behavior, a sample of 7-year-olds probably would not be appropriate because it is not clear that individuals of this age have developed the cognitive skills inherent in this theory.
6. What was the **accessible population** for the sample? Is the accessible population for the study a reasonable choice? Specifically, do you think that the accessible population differed from the theoretical population in ways that could affect the outcome or conclusions of the study? Explain your conclusion.
7. Did the researcher use some sort of **sampling frame**? If so, do you think the sampling frame was adequate? Explain your conclusion.
8. Did the researcher establish screening criteria for selecting the sample? What were the criteria? Do you think they were appropriate criteria, given the research question, theoretical framework, and theoretical population for the study? Explain your conclusion.
9. Name the specific kind of sample used, such as a completely random sample, a stratified random sample, a referral sample, or a purposive (judgmental) sample. If the sampling process was multi-stage, identify the specific kind of sampling approach in each stage. Remember **NOT** to confuse screening criteria and judgmental criteria and not to confuse a non-probability sample (like a volunteer sample) with a judgmental sample. If the author used a purposive or judgmental sample, name the specific type of sample taken.
10. Describe briefly in your own words the procedures the researcher used to select or recruit participants for the study. What was the sample size?
11. Do you think the researcher needed a probability sample? Refer back to the research question as you think about this. Remember that there are some instances in which the ability to generalize will depend greatly on having a probability sample. As you answer this question, call on the literature about sampling to show that you have a good understanding of sampling considerations and that you understand the relationships between the research question, the author's intentions with regard to statistical and theoretical generalization, and sampling.

- a. **If the researcher did attempt to get a probability sample**, did the sample meet all requirements for a true probability sample? If you think the sample failed to meet all requirements, what aspects of the sampling procedure do you think violated the requirements?
12. A probability sample is not necessary or useful in many cases. Sometimes, even though the author would like or needs a probability sample, it is not possible to get a probability sample and researchers use other kinds of samples, especially referral, quota and volunteer samples. Remember that there is no general rule or gold standard for sampling. The degree to which a sample is adequate depends largely on the author's research question and intentions with regard to statistical and theoretical generalization. Whatever type of sample taken, do you think the author's sample is adequate? As you answer this question, call on the literature about sampling to show that you have a good understanding of sampling considerations and that you understand the relationships between the research question, the author's intentions with regard to statistical and theoretical generalization, and sampling.
13. What **description of the sample does** the author provide, if any? This includes descriptive statistics. Do you think the characteristics included in the description of the sample are critical **in terms of characteristics that can affect the results of the study**? Why or why not? Refer to the research question as you consider your response.
14. All sampling approaches, except the volunteer sample, rely on selecting participants a priori. Rarely does every individual selected in a sample complete the research protocol. Some refuse to participate; the researcher fails to locate the individual; etc. What was the response rate for the sample? Do the authors explain, or can you, identify the factors that contributed to non-response? Do you think the response rate is "reasonably good"? You have to define "reasonably good." Do you think that there is reason to believe that the respondents and non-respondents differed in ways that can affect the results of the study? Explain your reasoning.
15. Researchers can rarely get the "perfect sample." Ultimately, as a professional who wants to use the results, you have to decide whether you are confident in extending the conclusions beyond the study sample. Overall, based on both the adequacy of the sampling approach, its execution, and your conclusions about response rate and characteristics of respondents and non-respondents, do you feel confident in extending the conclusions beyond the participants in the study? Think about things like (a) whether the sample seems to be representative of the theoretical population **in terms of characteristics that can affect the results of the study**; (b) the efforts made to try to get a representative sample in terms of the researcher's question and research design; (c) whether the author him/herself discusses any limitations of the sample; (d) how sample size was determined; (e) whether the authors used techniques like quota sampling to increase sample size for some groups; and (f) whether the author tries to extend the conclusions to groups with few representatives in the sample. Explain your conclusions.

| Assessment Criteria | Possible Points | Your Points |
|--|-----------------|-------------|
| Followed instructions, including full APA citations & references | 10 | |
| Provided complete, specific answers to all questions; stated the answers in your own words | 30 | |
| Applied the concepts discussed in class and covered in the required | 40 | |

| | | |
|---|------------|--|
| readings in answering the questions; demonstrated that you understand the key issues involved in sampling and can use what you have learned in class to evaluate samples | | |
| Consulted, used, cited and referenced extensive additional materials about sampling. I expect to see you use at least five sources of information that are directly relevant to the articles you review. | 20 | |
| Total | 100 | |

Assignment 4: Data Analysis (Group Assignment)

Objectives: After completing this assignment, you will be able to

- Identify and interpret the results of statistical analyses used to test for differences due to the result of implementing a treatment or intervention or differences between existing groups
- Identify and interpret the results of statistical analyses used to examine the relationships between predictor and outcome (independent and dependent variables)
- Explain the techniques used in qualitative data analysis and evaluate the results that are obtained at four different levels of analysis
- Evaluate the degree to which a study provides reliable, valid results
- Evaluate the contribution of a piece of research to the knowledge base and theory

This is a group assignment. You will use the same two articles you used for Assignment 3 -- sampling. Your grade will be a group grade. You will receive a peer evaluation of your contribution to the group project. Turn in two documents, one for the article from List A and one for the article from List B. Put all team members' names on the Word document. Use the following file name for the document and as the subject line in the e-mail:

LastName1_LastName2_LastName3_6800_A4_AnalysisListA or
LastName1_LastName2_LastName3_6800_A4_AnalysisListB

Components in the Assignment – NOTE that there are different questions for the article from List A and the article from List B

List A Article – Statistical Analyses

I have tried to give some examples of the “essence” of what I want you to explain in your response to each question for the statistical analyses. These are not the in-depth responses I expect from you, but they should help you understand what to cover.

1. Each member of the group should develop a flow chart for each article. I have provided an example of a completed flow chart (Flow Chart Example) at the course website. Use the Flow Chart Template at the website to develop your flow chart. For Assignment 4 (data analysis), fill out the columns on page 3 of the template (data analysis, results and conclusions). Compare your individual flow charts and develop a single group flow chart that represents your group’s consensus for each article. Turn in the **group** flow chart with **all pages completed** with this assignment.
2. What was the outcome or dependent variable? What level of measurement was used for this variable? In the flow chart example, the outcome variable was the score that participants received on a series of tests that measure job stress. This is an interval level of measurement. Do **not** confuse the outcome or dependent variable with the treatment in an

experiment or with characteristics used to establish comparison groups. In the flow chart example, “training regime” is the treatment, not an outcome variable. Gender is a characteristic used to establish comparison groups – male versus female.

3. State the hypothesis (or hypotheses) in the study. There may be more than one. I do not want you to state the null (statistical hypothesis). Use your own words and state the hypotheses clearly. Here are some examples. Participation in stress management training will significantly reduce the job stress experienced by employees. Women will respond more than men to stress management training. Do not just repeat what the author says. Demonstrate that you can identify and understand the author’s hypotheses
4. What statistical tests did the researcher employ? Why did the researcher select these tests? Use your statistical “cheat sheet” and Nardi to answer this question. In the flow chart example, the authors used two-way analysis of variance because they had two factors, training regime and gender. They could use this test because they have interval level data, the data are normally distributed, and variance is equal, and there are more than two comparison groups for one factor (training regime). They followed the ANOVA with the least significant difference test to see whether there was a difference between the individual treatments, e.g., treatment 1 versus treatment 2, treatment 1 versus control, and treatment 2 versus control.
5. What were the results of the tests? Explain the results in your own words. In the flow chart example, the intervention did produce a significant response in the outcome variable, meaning that stress management training was effective. However, the comparison of individual treatments showed that it was only treatment 2, a workshop plus refresher sessions, that differed significantly from the control.
6. What were the author’s research questions or objectives? What was the author trying to understand? State the author’s questions or objectives in your own words. What did the author learn in terms of answering the original research question(s)?
7. What conclusions did s/he draw? Remember that results are specific to the study. Conclusions refer to the theoretical contribution and the contribution to our overall understanding of a problem, issue or need and how to address it. Did the author(s) make a meaningful addition to our body of knowledge in terms of our ability to understand the phenomenon under study? Did s/he make a theoretical contribution? Explain your conclusion.
8. As a researcher and as someone who will want to apply research findings in your professional work, how do you evaluate the findings in this study in terms of (1) internal validity and (2) how much they can be generalized either statistically or theoretically (external validity)? Explain your conclusions, taking into account both the sampling approach used and the analytic procedures employed.

List B Article – Qualitative Data Analyses

Use the reference material “Brief Comments about Qualitative Data Analysis” in answering these questions, as well as the additional material we have covered in required readings for the course and other literature that you find on your own. I do not give examples of what to cover in these responses because there are many examples in the “Brief Comments” document. I will

divide some of these questions into the same topical areas covered in “Brief Comments” to help you know where to look in that document for help on the answers.

1. What kinds of data or information did the authors collect? Do the authors describe specific variables? Perhaps they provide a description of the topical areas covered in data collection.

Data Archival & Retrieval

2. Describe the procedures the researchers used to collect the data and how the data were archived?

Exploring the Case or Respondent

3. Explain how the researcher(s) analyzed the information from each individual case or respondent. Explicitly discuss whether and how they used memos, topical coding and analytic coding.

Finding Similarities between Cases or Respondents

5. How did the author(s) go about understanding the similarities among the cases or respondents? “Brief Comments” discusses two common approaches – the identification of common themes and the development of categories of respondents or cases. Did the authors use these approaches? If not, there are other ways of understanding the similarities, so do not limit yourself to these two alternatives in your response. Explain what they actually did.
6. What were their findings at this level of analysis? Do they specifically list themes that emerged, for example? The authors may not state this explicitly. If they do not, try to identify the similarities yourself.

Higher Level Abstraction

7. Did the authors try to develop “models” of some sort? Did they try to explain how the different cases “fit together” in patterns, or try to describe patterns of responses?
8. What were their findings at this level of analysis? Do they identify categories of respondents, for example? The authors may not state this explicitly. If they do not, try to identify the higher level abstractions yourself.

Explaining and Understanding

9. How did the authors finally “paint the picture” about what their data mean? How did they go about interpreting and explaining their data? Describe the process that they used.
10. Discuss how they synthesized the data. Specifically discuss the degree to which they used each of the four approaches to synthesis discussed in “Brief Comments.”
11. Discuss how and to what degree they tried to explain differences (or divergence) in their data. Specifically discuss the degree to which they used each of the four approaches to understanding differences discussed in “Brief Comments.”

Validation

12. To what degree did the authors examine alternative explanations to their own? For example, did they discuss alternative interpretations and explanations? Did they present alternative theoretical frameworks for examining the data?
13. "Brief Comments" lists six ways that researchers can help ensure that qualitative data analysis results in both valid and reliable conclusions. Discuss the degree to which the authors used each of these techniques.

Closure Questions

14. Look at the author's research question(s) or objectives. What did the authors learn in terms of answering their original research question(s)? State the overall findings in one paragraph.
15. Were the authors, in your assessment, trying to build or to test theory – or neither? Explain your reasoning. Did the author(s) make a meaningful addition to our body of knowledge in terms of our ability to understand the phenomenon under study? Did s/he make a theoretical contribution? Explain your conclusion.
16. As a researcher and as someone who will want to apply research findings in your professional work, how do you evaluate the findings in this study in terms of (1) internal validity and (2) how much they can be generalized either statistically or theoretically (external validity)? Explain your conclusions, taking into account both the sampling approach used and the analytic procedures employed.

| Assessment Criteria | Possible Points | Your Points |
|---|------------------------|--------------------|
| Followed instructions, including full APA citations & references | 10 | |
| Provided complete, specific answers to all questions; stated the answers in your own words | 30 | |
| Applied the concepts covered in class; demonstrated that you understand the key issues involved in data analysis and can use what you have learned in class to understand, interpret and evaluate results and conclusions | 40 | |
| Consulted, used, cited and referenced extensive additional materials about data analysis. I expect to see you use at least five sources of information that are directly relevant to the articles you review. | 20 | |
| Total | 100 | |

Preparation for Assignments 5 and 6 – Creating Your Own Designs

Required and Optional Assignments

You must complete Assignment 5, which involves designing a true or quasi-experiment. You can select which of three remaining designs you will use for assignment 6. You can complete an observational design (longitudinal or cross-sectional) or a case study. If you elect to complete an observational design, see the instructions for Observational Design. If you elect to complete a case study design, see the instructions for Case Study Design.

Key Components in Assignments 5 and 6

Use of the Literature. Assignments 5 and 6 draw heavily upon the work that you completed for Assignment 1. You will develop a research question (including evaluation questions) for each assignment based on one or more of the three mid-range theories you identify in Assignment 1. You may have more than one question. Researchers often pose one central or overarching research question, and then some secondary questions that flow from that overarching question. Yours must be an original research question, not one taken from the existing literature, although it should build upon what we already know. Draw upon your text, other required readings, and additional sources of information relevant to your theoretical framework and topic to develop your responses for these assignments. Go beyond the material covered in Assignment 1 in your exploration of the literature. Make sure you draw upon the body of contemporary research built on your theory and about your topic. You will need to go beyond the references that you provided in Assignment 1. That was a starting place for your exploration of the literature. You should also consult the literature about how to develop and frame research questions, including the material about the relationship between theory and research. Cite and reference all of the materials you use to develop your responses. Do not just “stick in” citations. Make it clear in your response how you drew upon a piece of literature in formulating your response. Include the following components in this assignment.

The Research Question. Research questions deal with explanation. They are intellectual in nature and answering them provides the knowledge that we need to solve problems, meet needs, understand why things happen as they do, or know why a program or intervention succeeds or fails. Theory-based research questions do not focus on “what happens,” but rather contribute to understanding of why and how things happen. We must confirm that the phenomenon we want to study exists (the “what” of research), but theory-based research goes beyond simple comparisons to explanation and understanding. For example, one of my students conducted a cross-sectional study for her thesis. In this case, her thesis work had an evaluative component because she wanted to know whether freshmen and seniors at UF **differ** with regard to environmentally responsible behaviors. This is a “what” question – are the two groups different? Specifically, her question was “To what degree does exposure to a campus environment that emphasizes sustainability affect students’ adoption of environmentally responsible behaviors?” She used this information to help the Office of Sustainability know whether their efforts are having the desired effect or not. However, her research question was a theory-based one and she therefore wanted to know **why** the adoption of environmentally responsible behaviors would differ between freshmen and seniors. Her specific question was “To what degree do locus of control, family norms, university norms, and barriers explain student’s adoption of environmentally responsible behaviors?” These four predictor constructs are theory-based and she wanted to know whether they do in fact influence behavior as the theory predicts, and, if so, whether the predictors of environmentally responsible behavior change because of prolonged exposure to UF’s emphasis on sustainability. She also decided that the environmental behavior model (theory) was an **insufficient** one for explaining how people come to adopt responsible environmental behaviors. She therefore incorporated two constructs from other theories, barriers and norms, to generate a more robust theory. This is one common way to approach research. You may therefore need to combine components from more than one of the mid-range theories to develop your research question(s).

Remember that the research question drives design. Do **not** use the same research question for these two assignments. This is a frequent error made in completing these assignments. Students try to make the same question “work” for more than one assignment. This is a blind alley and shows poor mastery of the logic involved in each design group and of their strengths and weaknesses.

My student, for example, could not realistically pose an experimental approach to her question. Here is what an experiment would “look like” for her research. “Freshmen students at the University of Florida will be randomly assigned to treatment and control groups. The treatment group will be exposed to a university atmosphere that emphasizes sustainability for four years and the control group will not.” I can write that down – but there is no reasonable way to achieve the isolation between treatment and control groups and to eliminate non-experimental variables that would be required to conduct this true experiment. The true experiment demonstrates **direct causality**. That is its strength. Even if students could be assigned to treatment and control groups, they will inevitably interact over the four years. Other sources of information about sustainability will affect both groups. Therefore, as a researcher you just cannot achieve the requirements of the true experiment in this case. Give up on direct causality – trying to show that exposure to a university environment and **that factor or treatment alone** created a difference between treatment and control groups. Instead, by using a cross-sectional design and examining the relationship between predictor variables like family norms and the outcome variable (responsible environmental behavior), the student could explore not only whether there is a difference after four years, but **what explains that difference**. She was not interested in direct causality. She was interested in the interaction and relationship among several factors that may affect the outcome.

Selection of Key Constructs & Variables. Most research questions focus on just a few of the key concepts and proposed linkages between them that are present in a theory. Yours probably will, too. Identify the key constructs that will form the basis for answering your research question. The researcher must go from construct (environmentally responsible behavior) to a variable (some kind of behavior that occurs in a specific context). Actually, ultimately, the researcher must go a step further and identify specific indicators (questions, items on a scale) that he/she will use to derive values for each variable. For example, my student examined environmentally responsible behavior **by college students**. She ultimately decided to focus on four variables to represent environmentally responsible behavior: mode of transportation, water conservation, energy conservation, and recycling. She chose these variables because they are the focus of UF’s sustainability program. Then she had to choose indicators for each. However, most college students cannot complete many behaviors, making them irrelevant or invalid indicators of environmentally responsible behaviors. Most college students, for example, do not buy appliances like clothes washers and dryers. This specific behavior therefore is **not** a good indicator for this context. On the other hand, college students can buy products that contain a high percentage of recycled material – like recycled paper. This is a good indicator. For this assignment, I am only asking that you define variables, not indicators.

Contribution to Theory

There are four common (but there are others) ways that research contributes to theory.

1. Some research tests a theory. This is particularly useful with recently developed theories. Usually, a theory has to “prove itself” in a number of tests before it is accepted by the scientific community. Testing new theories is therefore very important, but interest in testing generally declines as a theory becomes more widely recognized as having explanatory power.
2. Comparing the explanatory power of two or more theories is another common approach. In fact, this often follows testing as we try to decide which of several competing theories is best. For example, we might have two or three theories that are generally recognized, with different researchers arguing that one or the other has better explanatory power. Research that tests the theories with the same population helps us decide which is more robust.

3. Building or extending theory is a very common objective for researchers. The example above (responsible environmental behavior) built or extended a theory. This student took a theory commonly used to explain environmental behavior and added constructs from other, related behavioral theories to it. Her objective was to generate a more explanatory theory – one that does a better job than the original of explaining the behavior of interest. The basic theory of the environmental behavior model is used to explain learned behaviors in many settings. Therefore, her theoretical contribution is not just to explaining responsible environmental behavior, but rather has the change of contributing to our understanding of learned behaviors in general.
4. Finally, researchers may want to test the degree to which a theory is universally applicable. This involves taking a theory that has shown good explanatory power with some populations, or in some contexts, and applying it with a different population or under a broader range of conditions. Piaget conducted his early work dealing with the development stages of children, for example, with children from Europe and North America. Later researchers wanted to know whether the stages of development that he proposed were culturally specific, or whether they occurred for all children. They therefore tested his theory with children from many widely differing cultural backgrounds.

Assignment 5: True or Quasi-Experiment

Include the following components from Assignment 1 with your submissions for Assignments 5 and 6. If you revised the tables or conceptual maps based on my comments, please clearly indicate the revisions that you made when you resubmit them and I will be happy to reconsider your grade for Assignment 1. Revision is not required, however. I need these in front of me so that I can evaluate Assignments 5 and 6.

1. Attach a statement of the problem or need that you want to address.
2. Attach a copy of the table identifying and defining the major components in the theory or theories.
3. Attach a copy of the conceptual map of the theory or theories.

Objectives: After completing this assignment, you will be able to

- Evaluate when you must use an experiment to answer a research question
- Develop statistical hypotheses that can be tested through experiments
- Identify the specific design needed to best answer a research question
- Develop a sampling protocol that will meet the requirements of a specific experimental design;
- Select the appropriate methods of data analysis to answer the research question
- Analyze the strengths and weaknesses of a proposed research design in terms of internal and external validity and explanatory power.

For this assignment, you will create the design and accompanying protocol for a **true or quasi-experiment**. Use the following for the document file name and subject line in the e-mail:

YourLastName_6800_A5_Experiment

Components in the Assignment

Research Question, Hypotheses & Variables

1. State the research question(s) you plan to answer through a true or quasi-experiment. Remember that the research question drives the design. Make **sure** that you ask a research question that is appropriate for the experimental group of designs. For example, a question like “What is the relationship between parental monitoring and alcohol use and adolescent substance use,” would **not** be an appropriate question for the experimental group. For one thing, experiments **require** that you have a treatment because their strength is the ability to show direct cause and effect. You cannot expect to manipulate parental monitoring and alcohol use. There are other problems as well. In short, ask a question appropriate to this design group.
2. Describe the treatments (or factors) in the true or quasi-experiment. That is, explain what you will “do” to the participants in the treatment group(s). Remember that simply testing someone or asking them to fill out a questionnaire is **NOT** a treatment. A treatment is something that you do. Examples are training programs, counseling programs, and other kinds of interventions. If the design is factorial, describe the different levels of each factor included in the experiment.
3. Drawing on Assignment 1, identify the constructs and linkages in the theory that this study will explore. Fill out the blank table that follows. I have also provided an example table from work I have done training county extension faculty about the U.S. National Organic Standards. List the constructs of interest. Identify one or more variables (not items) that you will use to represent each construct. Indicate the level of measurement that you will use for each variable.
 - a. Identify the outcome or dependent variable(s) for this study. For this assignment, **use only one outcome variable.**
 - b. Very simple experiments have just one variable in them – the outcome variable. However, in this class we want to go beyond this very simple approach. We want to understand how or why the treatment created a change in the outcome variable. Identify **at least two independent or predictor variables** for your study. Name them and give a brief description of the measures that you will use (see example table). Please remember that descriptive characteristics of the sample and screening criteria are **not** independent variables, nor are the treatments. I encourage you to keep your experiment simple. A long list of predictor variables is problematic because you have to think about how you will measure each one (see example table). I am interested in your ability to develop an experiment. Listing many predictor variables typically does not indicate greater understanding of the design group. In fact, it may convince me that you do not understand the logic and structure of the design group since you could often use screening criteria to eliminate several of these variables and therefore reduce ambiguity in your outcomes. On the other hand, **do include** the variables that you cannot eliminate through screening and that may affect the outcome. I will be equally disappointed if you do not include those variables. Explain your reasons for selecting each variable (outcome and predictor).

Example: For example, I use the theory of planned behavior as the basis for designing my training programs. My outcome variable is change in behavior – that is my ultimate measure of the success of my programs. However, I also want to know why the program

works (or not). Based on the literature, I have decided that the predictor variable that I can probably affect in one time, short duration exposures to trainees is perceived behavioral control, and specifically perceived power or self-efficacy. I am spending a lot of time and effort creating training materials and programs that focus on changing this condition because I think it is “doable” in my normal setting and because the literature indicates that perceived power has a very strong influence on behavioral intention and ultimately on behavior. I need to know not only whether people are changing their behavior because of my programs, but also whether perceived power is the key to creating that change. Otherwise, I am wasting a lot of time and effort because discovery-based learning, key to perceived power, is a lot harder to do than the simple lecture. Therefore, in a true experiment I could assign people to treatment (discovery-based learning) and control (traditional lectures). I could measure the outcome – behavior – prior to and after the training. However, even if there were a difference between treatment and control group after the training, I would not know why. I at least need to measure perceived power (or self-efficacy) to make sure my focus on discovery-based learning is not a waste of time. I probably should measure behavioral intent, too, because that construct intervenes between perceived behavioral control and behavior in the model. Finally, even though knowledge is not a construct in the theory of planned behavior, we know that knowledge is a pre-requisite (but insufficient) condition for behavior change. Therefore, I also need to test change in knowledge. Therefore, my true experiment would have one dependent or outcome variable (behavior), and three independent or predictor variables (perceived power, behavioral intention, and change in knowledge).

Example Table

| Outcome/Dependent Measures | | |
|---------------------------------------|---|-----------------------------|
| Construct | Variable | Level of Measurement |
| Behavioral change | Behavior – weighted index score for 7 measures of increased work with and for organic farmers and consumers | Interval |
| Predictor/Independent Measures | | |
| Construct | Variable | Level of Measurement |
| Knowledge | Knowledge -- score on test of knowledge of National Organic Standards | Interval |
| Perceived Power | Self-efficacy -- score on 12 measures (items) of respondent’s confidence that s/he can use what they learned in the training to provide information for organic farmers and consumers | Interval |
| Behavioral Intent | Intent – unweighted index score for 7 measures of increased work with and for organic farmers and consumers | Interval |

Table Template

| Outcome/Dependent Measures | | |
|--------------------------------|-----------|----------------------|
| Construct | Variable | Level of Measurement |
| | | |
| Predictor/Independent Measures | | |
| Construct | Variables | Level of Measurement |
| | | |
| | | |

4. State the theoretical or research hypothesis(es) or propositions that you will test with this true or quasi-experiment. For example, my theoretical hypotheses are that (1) behavioral change will be greater using a discovery learning approach than a traditional lecture approach and (2) that perceived power will be the most important construct that I can affect in the kind of one-time, short-duration training sessions I conduct in Extension.
5. State the formal **statistical** hypotheses for the study. Remember that one-tailed hypotheses are superior to two-tailed hypotheses. For example, my main statistical hypothesis is that participants in the treatment (discovery-learning) group will demonstrate greater behavioral change than participants in the comparison (lecture) group, statistically significant at the 0.05 p value. Another hypothesis for me is that perceived power will be a stronger predictor of behavioral change than knowledge or behavioral intent, indicated by beta scores.

Design

6. Identify the general **type of design** (true or quasi-experiment) that you will use and the **specific research design** that you will use, by name (Solomon four group, switching replications, etc.). To do this, look at your notes from class, the material in your text, and outside readings. As you explore the literature about experimental designs, you will see that there are other experimental designs that we have not discussed in class. Consider these, too, as you make your decision.
7. Explain why you chose this specific design. For example, you may have decided to use a Solomon four-group design because you want to minimize the effects of testing bias in the results. You might decide to use a switching replications design because you want all of the participants to receive the treatment for ethical reasons or because you want to know if the effect of the treatment is persistent.
8. Explain how you will assign the participants to the treatment and control groups. The only case in which you should fail to assign participants to groups is that in which your design is a quasi-experiment using some sort of matched comparison (control) group.

Sample Selection

9. Identify the theoretical population for your study.
10. Identify the accessible population for your study. Explain why you think that the accessible population adequately reflects the theoretical population.

11. Identify the specific sampling approach that you will use (e.g., stratified random sample, volunteer sample, etc.).
12. If you will use a sampling frame, explain how you will construct the frame and why you think it will be adequate.
13. Explain how you will determine sample size. What will you take into account to decide how large your sample must be? Specifically identify the significance level.
14. Explain the screening criteria that you will use to make sure that your sample is homogeneous with regard to characteristics that may affect the outcome of the experiment. Explain your reasoning.

Analysis

15. Describe the steps in your data analysis process, in order. Identify the specific statistical analyses that you will use to test each hypothesis. Since you created statistical hypotheses for this assignment, you should be conducting statistical tests. Make sure that the level of measurement for the variables is sufficient for the proposed test. Explain the other assumptions that your data will have to meet to be able to use the proposed tests (for example, normal distribution). If you plan to use qualitative data analysis, explain the specific techniques you will use in some detail. Do not, for example, just say “I will use thematic analysis.” Explain what each step in the analysis will reveal – why you are doing it. I give two examples below – one for statistical analysis and one for qualitative analysis. Do **NOT** just repeat what I say here as your response. Your analysis process should answer your research question. There is no cookie cutter answer to this question. Provide a robust explanation that demonstrates that you understand the connections between design choices and analysis process.

Example of statistical analysis. My experiment would have three steps. First, I would run a paired t-test comparing treatment and control groups for the outcome variable (behavior change). This is a paired t-test because I am testing **change** in behavior, not just behavior. Therefore, I have to use a test that looks at both the pre- and post-training score for behavior. My statistical hypothesis was that “Trainees who receive a discovery-based learning experience will show significantly (alpha 0.05) greater change in behavior than those who receive a traditional lecture-based learning experience.” This test will reveal whether my hypothesis was confirmed or not – whether the discovery-based learning was superior with regard to behavior change. Second, I would run a paired t-test for each of three predictor variables, knowledge, perceived power and behavioral intent. These tests would reveal whether discovery learning affected the predictor variables. My hypothesis was that all three variables would be significantly greater for the treatment than the control group. I need to use a paired test because I am using change in knowledge, perceived power and behavioral intent. For all of these tests the data have to be interval. The scores have to be normally distributed. The variance must be equal for the two comparison groups, treatment and control. Finally, I will use linear regression to examine the relationships between the predictor and outcome variables.

Example for Qualitative Data Analysis. One of my students compared chronic (long-term, multiple occasions) and temporary (short term, one occasion) homeless people. She did **not** use an experiment, but her data analysis can give you an idea of

what you need to explain. She used interview data – narrative information. Her first step in data analysis was to use her interview notes to create a profile of each interview. She identified the responses of each participant that corresponded to each of four constructs of interest, group identity, group cohesion, leadership and goal definition. She also identified any responses that did not “fit” with any of these constructs. This step allowed her to capture the key components of each individual set of responses to the interview question. Her second step, conducted every time she accumulated three or four new interviews, was to identify theoretical and emergent themes. Themes are responses that have a shared comment – that are similar in meaning. Theoretical themes are those that “fit” one of the four constructs of interest. Emergent themes are those that do not “fit” within any of our pre-identified constructs. This procedure allowed the student to identify the commonalities and differences in responses among respondents. Ultimately, she compared the chronic and temporary homeless groups in terms of their potential for self-organization, based on the themes that emerged for each group.

Strengths & Weaknesses of the Design

16. Consider your design and protocol as a whole, including sampling and planned statistical analyses, with regard to **internal validity**. Remember that internal validity, for a realist, refers to the confidence that the conclusions that you reach are valid and justified. Internal validity involves both providing evidence that the explanation you propose (my idea that by increasing perceived power I can increase change in behavior) is valid **and** by your ability to show that other things probably did not cause any change you observe (eliminating alternatives).
 - a. What are the greatest strengths of your design and protocol with regard to internal validity? Put another way, what aspects of your design and protocol would reassure a reader that your conclusions are justified? Refer to the specific threats to internal validity that we have discussed in class. Consider each of them carefully as you answer this question. Be specific in your responses. Do not just repeat broad generalities about the kinds of strengths your design has in general. Respond in terms of your study and what you can do to make your study as strong as possible.

For example, in my proposed study I did four things that would give me some confidence in my conclusions. First, I set up a pre- and post-test of behavior for each. Any change that occurred should be the result of the training, and the treatment group should show a greater change in behavior. Second, I tested perceived power pre- and post-test for both treatment and control groups. I am proposing that I can change this condition by training. Any difference between pre- and post-training scores should be due to the training. Further, I should see a greater difference in the treatment than in the control group. So including this variable increased the internal validity of my study. Third, I also collected data about the intervening variable (behavioral intent). This helped, too. Finally, I plan to run regression analysis where I can confirm (or not) the proposed linkages between all these variables and, more important, I can see if perceived power is a more important (higher beta value) predictor of behavior in the treatment than in the control group. If so, this is one more piece of evidence that my idea is valid and justified. To eliminate other variables, I included a pre- and post-test of knowledge (this is something I really do usually do). Knowledge is not a construct in the theory of planned behavior, but we do know that knowledge is a pre-requisite for behavior. Therefore, I need to determine whether prior knowledge affected the outcome. Maybe all my participants were very

knowledgeable before the training – resulting in no affect. Worst yet, perhaps there was a pre-training difference in knowledge for the two groups. By including knowledge as a construct and testing pre- and post-training, I should be able to eliminate or at least evaluate the importance of knowledge in the outcome.

- b. What are the greatest weaknesses of your design with regard to internal validity? Consider each of them carefully as you answer this question. Be specific in your responses. Do not just repeat broad generalities about the kinds of strengths your design has in general. Respond in terms of your study. For example, in my study I have a potential problem because my sample is essentially a volunteer one. I cannot force people into my training sessions. They sign up because they are interested. For example, people who want to lose weight sign up in weight loss classes. If my training were “Diet Management for Weight Loss,” I could very possibly attract people who really want to change their eating habits. This could mean that almost any training approach will work, that I will not see a difference due to training method. On the other hand, since I conduct my training in a one-time, short-duration setting, I probably will not have to worry about mortality (dropouts).

17. Consider your design and protocol as a whole, including sampling and planned statistical analyses, with regard to **external validity**. Remember that external validity, for a realist, refers to the degree to which we can extend our findings, and especially our conclusions, to people, places, conditions, or circumstances other than those under which the study was conducted. Sometimes we want to generalize **statistically** and we almost always want to generalize **theoretically**. Address both types of generalization in your responses.

- a. Identify the key strengths of your study with regard to external validity. Consider both statistical and theoretical generalization. Be specific. Do not just include generalities about the design in general. Refer to what you plan to do. For example, unlike some experiments, my study is not at all “contrived,” so artificiality should not be a problem. By including a pre- and post-training test of knowledge and including this in the regression model, I strengthen theoretical generalization because I can compare the significance of knowledge (a key construct in other theories) and perceived power as predictors of change in behavior. If it turns out (which it does when I do this) that knowledge does change, but that it does **not** predict change in behavior, I go a long way toward saying that the theory of planned behavior is a good one when you have to deal with these short-term exposures to trainees.
- b. Identify the key weaknesses of your study with regard to external validity. Consider both statistical and theoretical generalization. Be specific. Do not just include generalities about the design in general. Refer to what you plan to do. People volunteer for my study because they want the training – they presumably have high motivation. This may pose some problems for **statistical** generalization. I probably can generalize the general conclusion that discovery-based learning will, in general, with lots of kinds of people, topics, places, etc., be superior to the traditional lecture-based learning in creating behavioral change. However, given the potential for high motivation on the part of my participants, I probably cannot generalize the **degree of change in behavior** from my study to other settings. In situations where motivation is not nearly as high, the “amount” of change might be considerably less. I also need to be careful about extending my conclusions to other kinds of training settings. I get a “one-time, short-duration” exposure to trainees. We cannot, based on my findings alone, conclude that the focus on discovery learning would result in similar behavioral changes under very different

conditions. This is an opportunity for more research – for example, in classroom settings where there is longer-term, repeated exposure.

18. Discuss the contributions to **explanatory power** of your study. Remember that explanatory power rests on the degree to which the researcher can explain the phenomenon under study in a complete and robust way. Explanatory power rests, to a large degree, on accumulating multiple kinds of evidence to support (or not) a theoretical explanation. Contributions to explanatory power often come from providing a different **kind of evidence**. For example, if most of the research about a specific topic has relied heavily on a single type of design, the scientific realist would argue that evidence from the other design groups is needed to enhance explanatory power. Contributions may also come from addressing parts of the theory that have been largely ignored in the research base. This may include, for example, verification of some aspects of the theory, extension of the theory to areas where it has not been tested before, or building new components into the theory, to name a few. What are the contributions of your study to explanatory power? What kinds of evidence will we have that we have not had before? What will we know or understand after you complete your study that we did not know or understand before? Refer to the discussion of how research can contribute to theory development in the document “Preparation for Assignments” linked from the course home page.
19. Finally, explain how your study will contribute to solving the problem or need that you want to address. What are the **implications** of your findings for practitioners? For example, my study could be used by people who train in non-formal, community-based educational settings to enhance the efficacy of their training. Most previous research has focused on classroom applications of the theory where the instructor has prolonged, repeated exposure to the participants.

| Assessment Criteria | Possible Points | Your Points |
|--|-----------------|-------------|
| Followed instructions, including full APA citations and references | | 5 |
| Provided complete, specific answers to all questions | | 15 |
| Demonstrated a thorough understanding of the considerations critical to designing experiments, including when and how to use this design group | | 20 |
| Was able to synthesize the material covered in this course to design an experiment that maximizes internal and external validity and explanatory power | | 40 |
| Consulted, used, cited and referenced extensive required and additional materials about research design, and particularly true and quasi-experiments. I expect you to use at least five sources of information that are directly relevant to the considerations for your study. | | 20 |
| Total | 100 | |

Assignment 6: Observational Design Option

You can complete an observational (cross-sectional or longitudinal) or case study design for Assignment 6. Follow the instructions for the correct design group. Include the following components from Assignment 1 with your submissions for Assignments 6. If you revised the tables or conceptual maps based on my comments, please clearly indicate the revisions that you made when you resubmit them and I will be happy to reconsider your grade for Assignment 1. Revision is not required, however. I just need these in front of me so that I can evaluate Assignment 6.

2. Attach a statement of the problem or need that you want to address.
3. Attach a copy of the table identifying and defining the major components in the theory or theories.
4. Attach a copy of the conceptual map of the theory or theories.

Objectives: After completing this assignment, you will be able to

- Evaluate when you must use a cross-sectional or longitudinal design to answer a research question
- Develop statistical hypotheses and/or the less formal “proposition” that can be evaluated through observational designs
- Identify the specific observational design needed to best answer a research question
- Develop a sampling protocol that will meet the requirements of observational designs
- Select the appropriate methods of data analysis to answer the research question
- Analyze the strengths and weaknesses of a proposed research design in terms of internal and external validity and explanatory power

You may use either a cross-sectional or longitudinal design. Use the following in the file name and subject line for the e-mail. ***YourLastName_6800_A6_Observational***

Research Question, Hypotheses or Propositions and Variables

1. State the research question you plan to answer through a longitudinal or cross-sectional design. Please remember that the research question drives design. This will be a **different** research question that the one you asked for the experimental design. Make sure that you ask a question that is appropriate for an observational design.
2. Define the comparison groups that you will use for your study. Remember that the observational designs are much stronger, especially with regard to internal validity, when comparison groups are used. If you have decided to use a single group design, justify your decision. That is, explain why you could **NOT** incorporate a meaningful comparison group into the design. Remember that ***comparison groups are not a variable.***
3. In Assignment 1 you created a table defining the key constructs in three theories and you drew conceptual maps of the three theories. Use the constructs in one or more of those theories for this assignment. Remember that one way to approach research is to combine constructs from more than one theory and that many intervention programs draw on constructs from more than one theory (see Preparation for Assignments). Identify the constructs and linkages in the theory(ies) that this study will explore. Make a table like the one below. List the constructs of interest. Identify one or more variables (not items) that you will use to represent each construct. Indicate the level of measurement that you will use for each variable. List at least one outcome variable and at least two predictor variables.

Table Template

| Outcome/Dependent Measures | | |
|--------------------------------|-----------|----------------------|
| Construct | Variable | Level of Measurement |
| | | |
| Predictor/Independent Measures | | |
| Construct | Variables | Level of Measurement |
| | | |
| | | |

- State your working or research hypothesis or hypotheses or propositions for this study.
- State the statistical hypothesis(es) or less formal proposition(s) for this study. You do need to state a statistical hypothesis if you plan to conduct statistical analyses. You can state the less formal proposition if you plan to use only qualitative analyses. Remember that one-tailed hypotheses or propositions are superior to two-tailed ones. If you used comparison groups, you should have at least one hypothesis or proposition that relates to the differences **between groups** that you expect to observe. For example, a statistical hypothesis could be that: "Athletes who participate in team sports will exhibit significantly greater hazardous alcohol use than athletes who participate in individual sports." You will **probably** also have one or more hypotheses or propositions that express the relationships between independent and dependent variables that you anticipate. For example, a proposition could be that: "Team cohesion and identity will be positively associated with hazardous alcohol use." These hypotheses may be **different** for the comparison groups.

Design

- Identify the general **type of design** (longitudinal or cross-sectional) that you will use and the **specific research design** that you will use, by name (longitudinal with replacement, multiple cohort longitudinal, etc.). To do this, look at your notes from class, the material in your text, and outside readings. As you explore the literature about observational designs you will see that there are other designs that we have not discussed in class. Consider these, too, as you make your decision.
- Explain why you chose this specific design. For example, you may have decided to use a repeated measures cross-sectional design to detect changes in group characteristics over time, or a multiple cohort longitudinal design to detect historical effects. Do not repeat generalities about the design. Rather, explain your own logic in selecting a specific design.

Sample Selection

- Identify the theoretical population(s) for your study.
- Identify the accessible population(s) for your study. Explain why you think that the accessible population(s) adequately reflects the theoretical population(s).
- If you will use a sampling frame, explain how you will construct the frame and why you think it will be adequate. Hint: You probably **will** need to construct a sampling frame for this design.

11. Identify the specific sampling approach that you will use (e.g., stratified random sample, volunteer sample, referral sample, etc.).
12. Describe any screening criteria that you will use. Explain your reasoning.
13. Explain how you will deal with a low response rate and, if appropriate to the sampling strategy, non-respondents.
14. Explain how you will determine sample size. What will you take into account to decide how big the sample must be? Specifically identify the significance level you will use. Discuss how you might go about determining permissible error and how you might be able to estimate heterogeneity. Remember, we need to consider sample size whether we are using statistical analyses or not.
15. Discuss any potential problems associated with mortality, especially if you are using a repeated measures design (either cross-sectional or longitudinal).

Analysis

16. Describe the steps in your data analysis process, in order. Identify the specific statistical analyses that you will use to test each hypothesis. If you created statistical hypotheses for this assignment, you should be conducting statistical tests. Make sure that the level of measurement for the variables is sufficient for the proposed test. Explain the other assumptions that your data will have to meet to be able to use the proposed tests (for example, normal distribution). If you plan to use qualitative data analysis, explain the specific techniques you will use in some detail. Do not, for example, just say “I will use thematic analysis.” Explain what each step in the analysis will reveal – why you are doing it. Your analysis process should be designed to answer your research question. There is no cookie cutter answer to this question. Provide a robust explanation that demonstrates that you understand the connections between design choices and analysis process.

Strengths & Weaknesses of the Design

17. Consider your design and protocol as a whole, including sampling and planned statistical and qualitative analyses, with regard to **internal validity**. Remember that internal validity, for a realist, refers to the confidence that the conclusions that you reach are valid and justified. Internal validity involves both providing evidence that the explanation you propose (my idea that by increasing perceived power I can increase change in behavior) is valid **and** by your ability to show that other things probably did not cause any change you observe (eliminating alternatives).
 - a. What are the greatest strengths of your design and protocol with regard to internal validity? Put another way, what aspects of your design and protocol would reassure a reader that your conclusions are justified? Refer to the specific threats to internal validity that we have discussed in class. Consider each of them carefully as you answer this question. Be specific in your responses. Do not just repeat broad generalities about the kinds of strengths your design has in general. Respond in terms of your study and what you can do to make your study as strong as possible.

- b. What are the greatest weaknesses of your design with regard to internal validity? Consider each of them carefully as you answer this question. Be specific in your responses. Do not just repeat broad generalities about the kinds of strengths your design has in general. Respond in terms of your study.
18. Consider your design and protocol as a whole, including sampling and planned statistical and qualitative analyses, with regard to **external validity**. Remember that external validity, for a realist, refers to the degree to which we can extend our findings, and especially our conclusions, to people, places, conditions, or circumstances other than those under which the study was conducted. Sometimes we want to generalize **statistically** and we almost always want to generalize **theoretically**. Address both types of generalization in your responses.
- c. Identify the key strengths of your study with regard to external validity. Consider both statistical and theoretical generalization. Be specific. Do not just include generalities about the design in general. Refer to what you plan to do to strengthen external validity.
- d. Identify the key weaknesses of your study with regard to external validity. Consider both statistical and theoretical generalization. Be specific. Do not just include generalities about the design in general. Refer to potential weaknesses in **your** design and protocol.
20. Discuss the contributions to **explanatory power** of your study. Remember that explanatory power rests on the degree to which the researcher can explain the phenomenon under study in a complete and robust way. Explanatory power rests, to a large degree, on accumulating multiple kinds of evidence to support (or not) a theoretical explanation. Contributions to explanatory power often come from providing a different **kind of evidence**. For example, if most of the research about a specific topic has relied heavily on a single type of design, the scientific realist would argue that evidence from the other design groups is needed to enhance explanatory power. Contributions may also come from addressing parts of the theory that have been largely ignored in the research base. This may include, for example, verification of some aspects of the theory, extension of the theory to areas where it has not been tested before, or building new components into the theory, to name a few. What are the contributions of your study to explanatory power? What kinds of evidence will we have that we have not had before? What will we know or understand after you complete your study that we did not know or understand before? Refer to the discussion of how research can contribute to theory development in the document “Preparation for Assignments” linked from the course home page.
21. Finally, explain how your study will contribute to solving the problem or need that you want to address. What are the **implications** of your findings for practitioners?

| Assessment Criteria | Possible Points | Your Points |
|---|-----------------|-------------|
| Followed instructions, including full APA citations and references | | 5 |
| Provided complete, specific answers to all questions | | 15 |
| Demonstrated a thorough understanding of the considerations critical to designing observational studies, including when and how to use this design group | | 20 |
| Was able to synthesize the material covered in this course to design an Observational study that maximizes internal and external validity and explanatory power | | 40 |

| | | |
|---|------------|----|
| Consulted, used, cited and referenced extensive required and additional materials about research design, and particularly observational designs. I expect you to use at least five sources of information that are directly relevant to the considerations for your study. | | 20 |
| Total | 100 | |

Assignment 6: Case Study Design Option

Objectives: After completing this assignment, you will be able to

- Evaluate when you must use a case study design to answer a research question
- Develop hypotheses and/or the less formal “propositions” that can be explored through case study designs
- Identify the specific case study design needed to best answer a research question
- Develop a sampling protocol that will meet the requirements of case study designs
- Select the appropriate methods of data analysis to answer the research question
- Analyze the strengths and weaknesses of a proposed research design in terms of internal and external validity and explanatory power

For this assignment, you will develop the design and protocol for an **explanatory** case study. Use the following for the file name and subject line in the e-mail:

YourLastName_6800_A6_Case

Research Question, Hypotheses or Propositions and Variables

1. State the research question you plan to answer through a case study design. Please remember that the research question drives design. This will be a **different** research question that the one you asked for the experimental design. Make sure that you ask a question that is appropriate for an observational design.
2. Remember that the case study design rests on working backward from a known outcome or state to try to understand what led to that state. Just as is true for the observational designs, case studies are much stronger, especially with regard to internal validity, when the researcher selects cases that exhibit **different** outcomes or states. That is, the principle of incorporating comparison groups into research design still holds, especially for explanatory (as opposed to descriptive) case study designs. What **differences** in outcome or state will you use to select the cases for your study? In the case of smoking, the different states were people with lung cancer and people who did not have lung cancer. These were the comparison groups. In a study I read recently, the outcome state of interest was the degree to which divorced fathers continued to participate in the lives of their children. The researcher defined two states, highly involved and minimally involved to absent. If you have decided to use a design without comparison groups, justify your decision.
3. In Assignment 1 you created a table defining the key constructs in three theories and you drew conceptual maps of the three theories. Use the constructs in one or more of those theories for this assignment. Remember that one way to approach research is to combine constructs from more than one theory and that many intervention programs draw on constructs from more than one theory (see Preparation for Assignments). Identify the constructs and linkages in the theory(ies) that this study will explore. Complete the table template below. List the constructs of interest. Identify one or more variables (not items) that you will use to represent each construct. Indicate the level of measurement that you will use

for each variable. In case studies, the outcome or state used to identify comparison groups may also be a dependent variable. However, it is more common that a number of variables are used that are indicative of or related to the outcome or state used to identify comparison groups. For example, in the study about involvement of divorced fathers, the student sued several outcome variables like frequency of contact with the child, joint custody, frequency of extended periods with the child, and awareness of problems or issues in the child's life as outcome variables. That is, in his study "extent of involvement in the child's life" was the outcome or state used to establish membership in one of two comparison groups and these other outcome variables were used as the variables to define that state. Identify the dependent variable(s) for this study and indicate the level of measurement you will use (may well be nominal data in the narrative form). Identify the explanatory (independent or predictor) variables for your study. There may be many of them. Indicate the level of measurement you will use for each in the table (may well be nominal data in the narrative form).

| Outcome/Dependent Measures | | |
|--------------------------------|-----------|----------------------|
| Construct | Variable | Level of Measurement |
| | | |
| Predictor/Independent Measures | | |
| Construct | Variables | Level of Measurement |
| | | |
| | | |

4. State the working or research hypothesis or hypotheses or propositions that you will explore with this study. These may be tentative since we usually have relatively little information about the explanatory mechanisms at work in case study designs. Put another way, if we knew the predictor variables, we probably would not need to conduct a case study! E.g., these may be tentative propositions.
5. If you plan to use statistical analyses, state the statistical hypothesis(es) for this study. You do need to state a statistical hypothesis if you plan to conduct statistical analyses. Remember – many case studies do use statistical analyses. Case studies do not necessarily rely on qualitative data analysis, as deVaus somewhat implies.

Design

6. Describe your design in detail. Consult the diagram below and locate your case study in this typology. For example, your design may entail holistic and embedded units. If so, describe these. You might be interested in differences in high school graduation rates – why school systems differ in graduation rate. Depending on your theoretical perspective, you could anticipate that characteristics of the school itself (quality of teaching, involvement of the PTA), of the families of the students in the school (socio-economic status, family composition, family educational goals), and of the student him/herself (peer networks, normative values) all play a role. In this case, your holistic unit of analysis would be the high school, with families as embedded units within the school and with individual students as embedded units within both families and the school. Similarly, your study might be retrospective in nature; e.g., you may want to focus on the historic conditions that help explain the outcome or state (what the subject of your investigation is like today). Or, your

study may be a-historical, focusing instead on the current conditions that help create, enhance or perpetuate different outcomes or states. Explain and justify your decisions about design.

| | Single Case Designs | | Multiple Case Designs | | | |
|--|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|
| Holistic (single unit of analysis) | State or Outcome 1 | | State or Outcome 1 | | State or Outcome 2 | |
| | Case 1 | | Case 1-1 | | Case 1-1 | |
| | | | Case 1-2 | | Case 2-2 | |
| | | | Case 1-3 | | Case 2-3 | |
| | | | Case 1-4 | | Case 2-4 | |
| State or Outcome 1 | | State or Outcome 1 | | State or Outcome 2 | | |
| Case 1 | | Case 1-1 | | Case 2-1 | | |
| Embedded (multiple units of analysis) | Embedded Unit of Analysis 1 | Embedded Unit of Analysis 2 | Embedded Unit of Analysis 1 | Embedded Unit of Analysis 2 | Embedded Unit of Analysis 1 | Embedded Unit of Analysis 2 |
| | Embedded Unit of Analysis 3 | | Case 1-2 | | Case 2-2 | |
| | | | Embedded Unit of Analysis 1 | Embedded Unit of Analysis 2 | Embedded Unit of Analysis 1 | Embedded Unit of Analysis 2 |

Sample Selection

7. Identify the theoretical population(s) for your study.
8. Identify the accessible population(s) for your study. Explain why you think that the accessible population(s) adequately reflects the theoretical population(s).
9. If you will use a sampling frame, explain how you will construct the frame and why you think it will be adequate.
10. Identify the specific sampling approach that you will use (e.g., stratified random sample, volunteer sample, referral sample, purposive, etc.). If you will use a purposive or judgmental sampling approach, describe it and name it if possible. Explain your sampling decisions.
11. Explain the screening criteria that you will use to make sure that your sample is homogeneous with regard to characteristics that may affect the outcome of the experiment. Explain your reasoning.
12. Explain how you will deal with a low response rate and, if appropriate to the sampling strategy, non-respondents.
13. Explain how you will determine sample size. What will you take into account to determine sample size, including any statistical criteria that may be relevant? Remember, we need to consider sample size whether we are using statistical analyses or not.
14. Discuss any potential problems associated with mortality, especially if you are using a prospective design.

Analysis

15. Describe the steps in your data analysis process, in order. Identify the specific statistical analyses that you will use to test each hypothesis. If you created at least one statistical hypothesis for this assignment, you should be conducting at least one statistical test. Make sure that the level of measurement for the variables is sufficient for the proposed test. Explain the other assumptions that your data will have to meet to be able to use the proposed tests (for example, normal distribution). If you plan to use qualitative data analysis, explain the specific techniques you will use in some detail. Do not, for example, just say “I will use thematic analysis.” Explain what each step in the analysis will reveal – why you are doing it. Your analysis process should be designed to answer your research question. There is no cookie cutter answer to this question. Provide a robust explanation that demonstrates that you understand the connections between design choices and analysis process.

Strengths & Weaknesses of the Design

16. Consider your design and protocol as a whole, including sampling and planned statistical and qualitative analyses, with regard to **internal validity**. Remember that internal validity, for a realist, refers to the confidence that the conclusions that you reach are valid and justified. Internal validity involves both providing evidence that the explanation you propose (my idea that by increasing perceived power I can increase change in behavior) is valid **and** by your ability to show that other things probably did not cause any change you observe (eliminating alternatives).
 - a. What are the greatest strengths of your design and protocol with regard to internal validity? Put another way, what aspects of your design and protocol would reassure a reader that your conclusions are justified? Refer to the specific threats to internal validity that we have discussed in class. Consider each of them carefully as you answer this question. Be specific in your responses. Do not just repeat broad generalities about the kinds of strengths your design has in general. Respond in terms of your study and what you can do to make your study as strong as possible.
 - b. What are the greatest weaknesses of your design with regard to internal validity? Consider each of them carefully as you answer this question. Be specific in your responses. Do not just repeat broad generalities about the kinds of strengths your design has in general. Respond in terms of your study.
17. Consider your design and protocol as a whole, including sampling and planned statistical and qualitative analyses, with regard to **external validity**. Remember that external validity, for a realist, refers to the degree to which we can extend our findings, and especially our conclusions, to people, places, conditions, or circumstances other than those under which the study was conducted. Sometimes we want to generalize **statistically** and we almost always want to generalize **theoretically**. Address both types of generalization in your responses.
 - e. Identify the key strengths of your study with regard to external validity. Consider both statistical and theoretical generalization. Be specific. Do not just include generalities about the design in general. Refer to what you plan to do to strengthen external validity.

- f. Identify the key weaknesses of your study with regard to external validity. Consider both statistical and theoretical generalization. Be specific. Do not just include generalities about the design in general. Refer to potential weaknesses in **your** design and protocol.

18. Discuss the contributions to **explanatory power** of your study. Remember that explanatory power rests on the degree to which the researcher can explain the phenomenon under study in a complete and robust way. Explanatory power rests, to a large degree, on accumulating multiple kinds of evidence to support (or not) a theoretical explanation. Contributions to explanatory power often come from providing a different **kind of evidence**. For example, if most of the research about a specific topic has relied heavily on a single type of design, the scientific realist would argue that evidence from the other design groups is needed to enhance explanatory power. Contributions may also come from addressing parts of the theory that have been largely ignored in the research base. This may include, for example, verification of some aspects of the theory, extension of the theory to areas where it has not been tested before, or building new components into the theory, to name a few. What are the contributions of your study to explanatory power? What kinds of evidence will we have that we have not had before? What will we know or understand after you complete your study that we did not know or understand before? Refer to the discussion of how research can contribute to theory development in the document “Preparation for Assignments” linked from the course home page.

19. Finally, explain how your study will contribute to solving the problem or need that you want to address. What are the **implications** of your findings for practitioners?

| Assessment Criteria | Possible Points | Your Points |
|--|-----------------|-------------|
| Followed instructions, including full APA citations and references | | 5 |
| Provided complete, specific answers to all questions | | 15 |
| Demonstrated a thorough understanding of the considerations critical to designing case studies, including when and how to use this design group | | 20 |
| Was able to synthesize the material covered in this course to design a case study that maximizes internal and external validity and explanatory power | | 40 |
| Consulted, used, cited and referenced extensive required and additional materials about research design, and particularly case study designs. I expect you to use at least five sources of information that are directly relevant to the considerations for your study. | | 20 |
| Total | 100 | |

University of Florida Policies

Academic Honesty: All students are expected to be honest in all their academic work. Failure to uphold the standards of honesty will result in the appropriate disciplinary action by the University of Florida. As a result of completing the registration form at the University of Florida, every student has signed the following statement:

“I understand that the University of Florida expects its students to be honest in all their academic work. I agree to adhere to this commitment to academic honesty and understand that my failure to comply with this commitment may result in disciplinary action up to and including expulsion from the university.”

UF Counseling Services: Resources are available on campus for students having personal problems or lacking clear career and academic goals which interfere with their academic performance. These resources include: (1) University Counseling Center, 301 Peabody Hall, 392-1575, personal and career counseling; (2) Student Mental Health, Student Health Care Center, 392-1171, personal counseling; (3) Sexual Assault Recovery Services (SARS), Student Health Care Center, 392-1161, sexual counseling; and (4) Career Resource Center, Reitz Union, 392-1601, career development assistance and counseling.

Software Use: All faculty, staff and students of the university are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are against university policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity.

Classroom Accommodation: Students requesting classroom accommodation must first register with the Dean of Students Office. The Dean of Students Office will provide documentation to the student who must then provide this documentation to the Instructor when requesting accommodation.