Introduction to Quantitative Research Methods in Education
Education 793
Fall 2014
Syllabus

Professor

Dr. Peter Riley Bahr
School of Education, Room 2108D
prbahr@umich.edu

Graduate Student Instructors (GSIs)

Mr. Adam Hengen
School of Education, Room 2108
ahengen@umich.edu

Mr. Joe Howard
School of Education, Room 2030M
joehow@umich.edu

Teaching Apprentice

Mr. Nicolas Boileau
School of Education, Room 2108
nboilea@umich.edu

Course Description

This course provides an introduction to quantitative reasoning in empirical research, particularly the execution and interpretation of commonly used descriptive and inferential statistical techniques.

Knowledge Goals

- basic terminology of statistics
- test of difference of two means
- basic approaches to sampling
- test of difference of two proportions
- levels of measurement
- one-way analysis of variance
- frequency distributions
- contingency tables
- basic graphical descriptive techniques
- odds ratios
- univariate measures of central tendency
- chi-squared
- univariate measures of dispersion
- gamma
- outliers
- ordinary least squares regression
- sampling distribution
- linear correlation coefficient
- point estimates
- coefficient of determination
- types of inferential error
- dummy variables in regression
- confidence interval for mean
- multiple linear regression
- confidence interval for a proportion
- causal diagrams
- test of significance of a mean
- nested regression models
- test of significance of a proportion
- writing for scholarly outlets
Schedule

Class Meeting @ School of Education, Room 2229  Wednesdays 1:00pm–4:00pm
Lab with Hengen @ Angell/Mason Hall, Room G444B  Thursdays 8:00am–10:00am
Lab with Howard @ Angell/Mason Hall, Room G444A  Thursdays 1:00pm–3:00pm

Bahr’s Office Hours  by appointment
Hengen’s Office Hours  Tuesdays 11:00am–2:00pm
Howard’s Office Hours  Wednesdays 9:00am–12:00pm
Boileau’s Office Hours  Fridays 1:00pm–3:00pm

Assignment #1 Due  Friday, September 19
Assignment #1 Returned  Monday, September 22
Assignment #2 Due  Friday, October 10
Assignment #2 Returned  Monday, October 13
Exam #1  Wednesday, October 15
Deadline for Meeting #1 with GSIs concerning Final Paper  Friday, October 31
Assignment #3 Due  Friday, November 7
Assignment #3 Returned  Monday, November 10
Deadline for Meeting #2 with GSIs concerning Final Paper  Friday, November 21
Assignment #4 Due  Friday, December 5
Assignment #4 Returned  Monday, December 8
Exam #2  Wednesday, December 10
Final Paper Due  Friday, December 12

Required Texts


Other Required Materials and Resources

- Daily access to your U-M email account and to ctools.umich.edu.
- One pencil (pencil, not pen, must be used to complete the exams)
- One basic hand calculator for class and lab exercises, assignments, and exams
- One deck of standard playing cards
- One USB flash drive
Grading

The components of your course grade include:

<table>
<thead>
<tr>
<th>Component</th>
<th>Points</th>
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<tbody>
<tr>
<td>Assignments (4 assignments @ 5 points each)</td>
<td>20 points</td>
</tr>
<tr>
<td>Exam #1</td>
<td>20 points</td>
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<tr>
<td>Exam #2</td>
<td>20 points</td>
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<tr>
<td>Final Paper</td>
<td>40 points</td>
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</tbody>
</table>

Total of 100 points

Course grades will be determined by the total number of points achieved, as follows:

<table>
<thead>
<tr>
<th>Points</th>
<th>Grade</th>
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<tbody>
<tr>
<td>98–100</td>
<td>A+</td>
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<tr>
<td>92–97</td>
<td>A</td>
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<tr>
<td>90–91</td>
<td>A-</td>
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<td>88–89</td>
<td>B+</td>
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<td>82–87</td>
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<td>80–81</td>
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<td>72–77</td>
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<td>70–71</td>
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<tr>
<td>68–69</td>
<td>D+</td>
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<tr>
<td>62–67</td>
<td>D</td>
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<tr>
<td>&lt; 60</td>
<td>F</td>
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</table>

Participation

Learning is a collaborative process, and this course is structured around the assumption of active collaboration and co-ownership. Although I take responsibility for the overall design and direction of the course, you share the responsibility of creating a rich intellectual environment and a fruitful dialogue. Therefore, please read each assigned reading carefully and come to each class and lab meeting prepared to participate actively and respectfully, to ask questions, to discuss the salient issues and problems that emerge from the readings, and to utilize and contribute your knowledge and professional experiences in addressing the course material. Active, thoughtful, respectful participation and contribution in class and lab activities are required in this course.

Assignments

Four assignments will be made available to you via CTools. Each assignment will provide to you the opportunity to master the statistical techniques and interpretive logic that will be addressed in the exams. Each assignment is due in hardcopy (paper) format in the designated mailbox in Room 2117 of the School of Education no later than 12:00pm on the designated due date. Each assignment will be returned no later than 12:00pm on the following Monday (i.e., within 72 hours). Although you will receive feedback on your work, each assignment will be graded only as “complete” (5 points) or “incomplete” (0 points). In other words, if you complete and submit each assignment on time, you will receive full credit even if corrections to your work are necessary. It is recommended, but not required, that you write your answers to the assignment questions by hand and in pencil, just as you will be required to do on the exams.
Exams

Two non-comprehensive, in-class exams will be administered in this course. During each exam, you will be allowed to use a basic hand calculator and four pages (both sides of four 8.5" x 11" sheets of paper) of handwritten (not typed, photocopied, or electronically printed) notes. You will not be allowed to use the course textbooks, a computer, a graphing or programmable calculator, or any other aids during the exams. Each exam will be offered on one date only, at one time only, and in one place only, except in cases in which the Americans with Disabilities Act applies. A missed exam will result in zero credit on that exam.

Final Paper

The culmination of this course is a single paper on a topic of your choosing. The paper will take the form of an empirical research manuscript of modest length. You may work on the final paper alone or in a team of two. The requirements of the assignment are the same whether you choose to work alone or in a team. Details about the assignment are provided later in this document.

Selected Course Policies (a guide, not an exhaustive list)

Attendance

Class and lab attendance is a necessary cause, though not a sufficient cause, of participation in the course, and participation is expected and required.

Assigned Reading

The assigned reading is fundamental to this course. It is your responsibility to complete all assigned reading prior to the associated class meeting and to be prepared to participate actively in class and in lab by raising questions or points of discussion about the reading.

Electronic Communication

I assume that you have read any electronic communication that is sent to you by me or the GSIs within 24 hours of it being sent. You may assume the same about electronic communication that you send to me or to the GSIs. However, you should anticipate that it may be as long as 48 hours before you receive a response to your electronic communication during the course of the workweek. Response times may be as long as 72 hours on the weekends.

Recording of Lectures, Labs, and Other Class Activities

Audio and/or video recording of class activities is prohibited, except as a pre-arranged accommodation for students with disabilities. Under all other circumstances, students are prohibited from using recording equipment, including cellular phones, to make recordings of lectures, labs, or other class-related activities.
Late Assignments and Missed Exams

Late assignments will not be accepted, nor will exams or quizzes be rescheduled, except under the most extreme and unusual of situations. Situations that are sufficiently extreme and unusual to warrant the acceptance of a late assignment or the rescheduling of an exam or quiz may include, but are not limited to, cataclysmic destruction of the planet by an asteroid, abduction for a prolonged period of time by beings of extraterrestrial origin and hostile intention, widespread outbreak of zombies, or other extraordinary circumstances that would make for a good action flick with Bruce Willis or Angelina Jolie as the lead actor. Extenuating conditions of similar magnitude will be considered on a case-by-case basis.

Citations and References

The APA citation format must be employed in all documents submitted in this course, not because it is a particularly logical or user-friendly citation method, but because it is ubiquitous (and, in many cases, required) in educational research publications.

Plagiarism

Plagiarism — the intentional or unintentional use of the ideas or words of another person or organization without citing the source appropriately — is among the most stigmatizing of academic offenses. Plagiarism in any form will not be tolerated in this course and will result in a failing grade on the associated assignment and a report to the appropriate institutional authorities. Please see http://www.lib.umich.edu/shapiro-undergraduate-library/understanding-plagiarism-and-academic-integrity for more information about plagiarism.

Retention of Documents

Documents that you submit in this course that are not returned to you will be retained until May 31, 2015, and then discarded.

Guidelines for Class and Lab Discussions

This classroom includes, and is inclusive of, a diverse range of backgrounds, experiences, perspectives, and beliefs. I am committed to ensuring that a wide range of viewpoints are welcomed and valued here, and that everyone who wants to speak to a particular issue has the opportunity to do so in an environment of mutual respect. I ask you to join me in that commitment and to strive to uphold the goal of healthy discussion and debate without challenging any individual's identity or right to speak. Further, I ask that you listen carefully to others, especially when you disagree, and assume that each person in this classroom is speaking in good faith and with good intentions. If you ever feel that a discussion did not meet these guidelines, or otherwise has left you with negative feelings about the classroom environment, please speak with me about it.
Accommodations for Students with Disabilities

If you think that you need an accommodation for a disability, please speak with me at your earliest convenience. Some aspects of this course may be modified to facilitate your participation and progress. As soon as you make me aware of your needs, we can work together with the Office of Services for Students with Disabilities (SSD) to help us determine appropriate academic accommodations. SSD (734-763-3000; www.ssd.umich.edu) typically recommends accommodations through a Verified Individualized Services and Accommodations (VISA) form. Any information that you provide is private and confidential and will be treated as such.

Students’ Rights and Responsibilities

Membership in the academic community that is the University of Michigan affords you a number of important rights, as well as a number of important responsibilities. Please see http://www.oscr.umich.edu/statement/ for information about these rights and responsibilities.
<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Readings</th>
<th>Assignments</th>
<th>Exams</th>
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<tbody>
<tr>
<td>Wed 03-Sept-2014</td>
<td>Course introduction; Terminology; Data matrices; Frequency distributions; Measures of central tendency; Measures of dispersion; Outliers</td>
<td>Agresti &amp; Finlay, chap 1-3</td>
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<td>Acoc 4th, chap 1-2 / Acoc 3rd, chap 1-2</td>
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<tr>
<td>Wed 10-Sept-2014</td>
<td>Describing data with graphs; Sampling; Probabilities; Normal probability distribution and percentiles; Sampling distributions</td>
<td>Agresti &amp; Finlay, chap 4</td>
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<td>Aco 4th, chap 3-5 / Aco 3rd, chap 3-5</td>
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<td>Bring a deck of standard playing cards to class</td>
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<td>Wed 17-Sept-2014</td>
<td>z-scores; Hypothesis testing; Alpha; Tests of significance for means using the z-distribution; Point estimates; Confidence intervals for means using the z-distribution</td>
<td>No additional reading</td>
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<tr>
<td>Fri 19-Sept-2014</td>
<td>Assignment #1 due at 12:00pm</td>
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<td>Assignment #1</td>
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<td>Wed 24-Sept-2014</td>
<td>t-distribution; Tests of significance of means using the t-distribution; Confidence intervals for means using the t-distribution; Tests of significance for proportions; Confidence intervals for proportions</td>
<td>Agresti &amp; Finlay, chap 5-6</td>
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<td>Aco 4th, pgs 149-173 / Aco 3rd, pgs 147-170</td>
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<td>Bring a deck of standard playing cards to class</td>
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<td>Wed 01-Oct-2014</td>
<td>Tests of differences in means and proportions; Confidence intervals for differences in means and proportions</td>
<td>Agresti &amp; Finlay, chap 7</td>
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<td>Kargar, et al. (2010) [bring to class]</td>
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<td>Bring a deck of standard playing cards to class</td>
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<td>Wed 08-Oct-2014</td>
<td>One-way analysis of variance</td>
<td>Agresti &amp; Finlay, pgs 369-378</td>
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<td>Aco 4th, pgs 215-228 / Aco 3rd, pgs 205-218</td>
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<td></td>
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<td>Bahr (2007) [bring to class]</td>
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<tr>
<td>Fri 10-Oct-2014</td>
<td>Assignment #2 due at 12:00pm</td>
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<td>Assignment #2</td>
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<tr>
<td>Wed 15-Oct-2014</td>
<td>Exam #1</td>
<td>No additional reading</td>
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<tr>
<td>Date</td>
<td>Topic</td>
<td>Reading Material</td>
<td>Notes</td>
<td>Remarks</td>
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| Wed 22-Oct-14| Contingency tables; Chi-squared; Adjusted residuals for contingency tables; Odds ratios; Gamma | Agresti & Finlay, chap 8  
Acock 4th, chap 6 / Acock 3rd, chap 6 | ---                      | ---               |
| Wed 29-Oct-14| Scatter plots; Ordinary least squares regression; Pearson’s correlation coefficient; Coefficient of determination | Agresti & Finlay, chap 9  
Acock 4th, chap 8 / Acock 3rd, chap 8 | ---                      | ---               |
| Wed 05-Nov-14| Assumptions of linear regression; Linear regression with a dichotomous or categorical independent variable (i.e., dummy variables) | Agresti & Finlay, chap 10  
Agresti & Finlay, pgs 379-381 | ---                      | ---               |
| Fri 07-Nov-14| Assignment #3 due at 12:00pm                                       | ---                      | Assignment #3       | ---               |
| Wed 12-Nov-14| Multiple linear regression                                          | Agresti & Finlay, chap 11  
Agresti & Finlay, pgs 413-422  
Acock 4th, chap 10 / Acock 3rd, chap 10 | ---                      | ---               |
| Wed 19-Nov-14| Multiple linear regression                                          | To be announced           | ---                      | ---               |
| Wed 26-Nov-14| No Class Meeting (Thanksgiving Holiday)                             | No additional reading   | ---                      | ---               |
| Wed 03-Dec-14| Causal diagrams; Nested regression models                          | Bahr (2007) [bring to class]  
Nunes, et al. (2012) [bring to class] | ---                      | ---               |
| Fri 05-Dec-14| Assignment #4 due at 12:00pm                                       | ---                      | Assignment #4       | ---               |
| Wed 10-Dec-14| Exam #2                                                              | No additional reading   | ---                      | Exam #2           |
References


Introduction to Quantitative Research Methods in Education  
Education 793 
Fall 2013 
Final Paper

Description

The culmination of this course is a single paper on a topic of the student’s choosing. The paper will take the form of an empirical research manuscript of modest length, including all twelve of the following sections:

1. introduction  
2. literature review  
3. hypotheses  
4. data  
5. measures  
6. method of analysis  
7. results  
8. discussion of findings  
9. references  
10. tables  
11. figures  
12. appendices

Students may work on the paper alone or in a team of not more than two. The requirements of the assignment are the same whether students choose to work alone or in a team.

Due Dates

1. Each student (or team) must meet with his/her GSI to discuss his/her research plan no later than Friday, October 31, 2014. The purpose of the meeting is to refine the student’s goals and plans for the completion of the project. Appointments are required. In preparation for this meeting, you must assemble a document that addresses the following and submit it to your GSI as an email attachment at least 48 hours in advance of your meeting. Note that, as your statistical skills develop in this course, your goals and plan for the final paper may change somewhat, but this document nevertheless will be a useful tool for receiving early feedback concerning your ideas and plan.

   a. your research question or questions, stated in one or two sentences
   b. the purpose of your study and what you expect to find, stated in one or two paragraphs and citing at least two relevant published sources
   c. the list of variables that you propose to use in executing your study
   d. your null and alternative hypotheses
   e. Stata output addressing tabular descriptive (univariate) statistics and frequency distributions for each of the variables that you propose to use
   f. a list of APA-formatted references for the sources that you cite

2. Each student (or team) must meet with his/her GSI to review draft materials for the final paper no later than Friday, November 21, 2014. Appointments are required. Note that, generally speaking, this is the only time that a member of the instructional team will review a draft of the final paper. Therefore, it is in each student’s (or team’s) best interest to provide a draft that is as complete and polished as possible.
3. The final paper is due at noon on Friday, December 12, 2014.

Submission Instructions

1. Prepare a single electronic copy of the paper. The electronic copy of the paper must be in Microsoft Word format. Use the following conventions in naming the electronic copy of the paper. Note that you should replace the word “last name” with your last name.

   finalpaper_lastname.doc (if working alone)
   finalpaper_lastname#1_lastname#2.doc (if working in a team)

2. Prepare a single printed copy (one copy per student or per team) of the paper. The printed copy of the paper must be stapled.

3. Upload the electronic copy of the paper into the “Drop Box” on the course CTools website no later than 12:00pm on December 12, 2014. If you are working in a team, the electronic copy should be uploaded into only one drop box.

4. Place the printed copy of the paper in your GSI’s mailbox in the CSHPE main office no later than 12:00pm on December 12, 2014.

Requirements

At a minimum, the research that underlies the content of the paper must meet all of the following criteria:

1. use data from the dataset provided in the course

2. use at least three variables in the execution of the required statistical methods

3. use a statistical software package to execute at least one statistical method from each of the following three groups:
   - Group #1: t-test comparison of two means or one-way analysis of variance
   - Group #2: z-test comparison of two proportions or chi-squared
   - Group #3: multiple regression of a quantitative dependent variable

NOTE: Requirement #1 demands a quantitative dependent variable and a categorical or dichotomous independent variable. Likewise, Requirement #3 demands a quantitative dependent variable and at least two independent variables that may be quantitative, categorical, or dichotomous. In contrast, Requirement #2 demands two categorical or dichotomous variables, though one reasonably might collapse a quantitative variable into an ordinal or dichotomous variable if doing so is justified analytically. You also are encouraged to employ other variables in your analyses, in addition to the few that are necessary to meet the basic requirements of the assignment.
4. provide descriptive statistics (e.g., measures of central tendency and dispersion) as appropriate to the levels of measurement of the chosen variables

5. provide at least three tables, one of which must address the descriptive statistics

6. provide at least one computer-generated graphical figure (e.g., bar graph, histogram, scatter plot)

Useful Websites

- http://nces.ed.gov/surveys/nels88/

Format

The final paper must meet all of the following format criteria:

1. include all ten of the sections noted in the “Description” on the first page of this assignment, in the exact order in which these sections are listed

2. not include any tables that are copied from Stata output or the output of any other statistical program (note: it is acceptable to copy graphs and figures, but not tables, from Stata output or from the output of another statistical program)

3. be not more than 3,500 words in length, excluding references, tables, figures, and appendices

4. cite at least six peer-reviewed journal articles, in addition to any other reputable sources that you deem appropriate and useful

5. employ APA-formatted citations and references

6. utilizes efficient “to the point” writing

7. be free of spelling, grammatical, and punctuation errors

8. include a title page that lists the title of the paper, the word count (excluding references, tables, figures, and appendices), the date of submission, and the full legal names of all authors

9. be typed in a 12-point Times New Roman font

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1 The tables may not be copied and pasted from Stata or any other statistical program. You must create your own tables and strive for professional presentation in the preparation of your tables.
10. be double-spaced

11. be left-justified (except the title page, section headings, tables, and figures)

12. be stapled

13. be printed on only one side of each page

14. have one-inch margins throughout

**Description of Required Sections**

*Important Note: The word counts noted below are approximate and are provided only so that you will have a general sense of the relative length of the various sections of the paper. Actual word counts for each section will vary as a function of the research questions posed, the state of the relevant literature, the analyses conducted, etc.*

**Introduction (approximately 250 words in length)**

- Provide a brief explanation of why the reader should keep reading, by addressing questions such as:
  - Why, based upon prior research, should the reader care about this topic?
  - Why is this topic important?
  - What are the implications of this topic?

- Provide a framework for the reader to understand where this paper is heading, by addressing questions such as:
  - What specific research question(s) will be addressed in this paper?
  - How is/are this/these research question(s) related to prior research?
  - Why should the reader care about this/these specific research question(s) within the context of the larger topic?

- Describe briefly the data that you will employ in this study to address the research question(s) that you have posed.

**Literature Review (approximately 750 words in length)**

- The focus of your literature review is determined by your research question(s). As it pertains to your research question(s), your literature review should summarize, interpret, and integrate the prior empirical work that constitutes the current state of scientific knowledge on your chosen topic.

- Note that “summarizing, interpreting, and integrating the prior empirical work” draws attention to the fact that you are seeking, in essence, to tell a story to your reader about prior research. This story typically cannot be told effectively by simply listing studies and the findings of these studies in a sequence of a paragraphs. Instead, your goal is to
help your reader understand the similarities and differences in the research questions, methods, data, and/or findings of prior studies insofar as these similarities and differences frame and inform your research question(s).

- The literature review also lays a foundation for your hypotheses by providing the rationale for your particular suppositions (i.e. hypotheses, deductions, educated guesses) concerning what you expect to find in the data that you plan to analyze.

**Hypotheses (approximately 250 words in length)**

- Your hypotheses should follow logically from your literature review, which itself is driven by your research question(s). In this section, you should seek to make your deductive logic (the justification) for your hypotheses clear to your reader. In other words, your hypotheses should follow logically from the literature that you have discussed and cited, but you should seek to make your deductive reasoning fully transparent to your reader such that your reader will have no questions about how and why you arrived at the deductions that are driving your analysis.

- Describe in words (not equations) the hypotheses to be tested in this study, recognizing that hypotheses always are “falsifiable” statements. Falsifiable statements are those that the evidence (your analyses) either supports or contradicts, and about which there can be no equivocation.

- Note that, in research manuscripts, one tends to describe the alternative hypotheses, rather than the null hypotheses. The null hypotheses are assumed to be understood by the reader.

- Note also that, although the literature review tends to be used to discuss broad concepts (e.g., integration, persistence, proficiency, achievement), the hypotheses inevitably must address actual variables to which the researcher has access. These variables serve to represent (indicate the degree of presence or absence of) the concepts that were addressed in the literature review and that are the focus of your research question. For example, socioeconomic status is a broad concept that often is measured with variables such as educational attainment and income. However, educational attainment and income do not fully represent and capture all aspects of the concept of socioeconomic status. Educational attainment and income serve simply as indicators of varying levels/degrees of the concept of socioeconomic status.

**Data (approximately 250 words in length)**

- Describe the data that you will employ to test your hypotheses. Important aspects of the data include but are not limited to:
  - the source of the data,
  - the elements of which the data are composed (e.g., students, institutions),
  - the method of sampling,
  - the period of time that the data address,
– the population, if any, to which inferences from the data may be generalized,

**Measures (approximately 500 words in length)**

- Describe the variables that are the focus of your analysis. Important aspects of the variables include but are not limited to:
  - what concept each variable is intended to measure, represent, or indicate,
  - the level of measurement of each variable,
  - the categories of each variable that is measured as dichotomous, nominal, or ordinal,
  - the potential range of values of each variable that is measured as interval or ratio,

**Method of Analysis (approximately 250 words in length)**

- Describe the statistical methods that you will use to test your hypotheses, making specific reference to the variables that will be employed in these tests.

- Describe any important assumptions of these methods, and discuss the extent to which the data meet, or do not meet, these assumptions.

- If the data do not meet the assumptions of a particular statistical test that you are using in your analysis, discuss the potential ramifications for the interpretation of the results of that statistical test.

**Results (approximately 500 words in length)**

- Describe briefly the distributions of your variables, making reference to the table of descriptive statistics that you constructed and any associated figure(s).

- Describe the results of your statistical tests, making reference to the table(s) and figure(s) that you constructed to present this analysis.

- Note that you should strive at this point to describe the results of your analyses in your own words, rather than relying on Bahr’s *Guide to Statistics*.

- Note also that, once again, you are telling a story to the reader, albeit a story about your own analyses rather than about the research conducted by others in the past, as mentioned earlier in this document. The idea, here, is to walk your reader through your findings in a way that makes these findings meaningful in light of the prior literature and the hypotheses that are testing.

**Discussion of Findings (approximately 750 words in length)**

- Restate your research question(s), briefly referencing the key points raised in your literature review and citing relevant sources for these key points.
Restate your hypotheses and then explain whether the evidence (your findings) from your statistical tests supports or contradicts each of your hypotheses.

Connect the results of the tests with respect to your hypotheses back to your research question(s) and to your literature review, explaining how your findings add to or reshape the understanding of the issues that you addressed in your literature review.

Discuss the implications of your findings for future research, for policy, and/or for practice with regard to your topic.

Discuss the limitations and weaknesses of your study, the data and measures that you used, and your analytical techniques. Discuss how these limitations and weaknesses may have influenced your findings, as well as how they condition the interpretation of your findings. Discuss how researchers may seek to resolve these limitations and weaknesses in future research on your topic.

Provide recommendations for future research on your topic. In other words, what research questions should researchers ask next, and how might they go about answering these questions?

References (not included in the total word count of paper)

Provide in APA format a complete reference list of all works cited in your paper. Do not provide references for works that are not cited in your paper.

Tables and Figures (not included in the total word count of paper)

Provide each table and each figure on a separate page, titled and labeled appropriately, using as examples the various tables presented in the handouts provided to you in class throughout the semester.

Go back through your paper and add the bracketed and center-justified notation “[insert Table X about here]” or “[insert Figure X about here]” in the place in which each table or figure should be located, substituting the designated number of the table or figure for “X”. A given table or figure should be located between paragraphs, immediately after the paragraph in which the table or figure is first mentioned.

Appendix (not included in the total word count of paper)

In a section labeled “Appendix A”, provide your complete Stata “do” file, formatted in Courier New font with one-inch margins throughout.

Note that the requirement to double-space the paper does not apply to Appendix A.
Request for Waiver of Requirement to Use the Course Dataset

In exceptionally rare cases, a waiver of the requirement to use data from the course dataset for the final paper may be considered (see the “Requirements” section earlier in this assignment description document). Generally speaking, a waiver of this requirement is confined to students who are enrolled in graduate programs outside of the School of Education. If you would like to request consideration for such a waiver, you must provide compelling evidence that the data that you would like to use are suitable and sufficient to fulfill the requirements of the final paper assignment, that you have access and permission to use these data for the final paper assignment, that you have the data management and manipulation skills necessary to complete the assignment without the assistance of someone who is intimately familiar with your data, and that the learning objectives of this course will be fulfilled more completely in your particular case through the use of your preferred dataset rather than the course dataset.

To request consideration of a waiver of the requirement to use the course dataset, please submit to the Professor the following three documents as attachments to a single email:

Document #1 — a signed letter from the principal investigator who is responsible for the data that you would like to use, indicating that you have permission to use these data for the final paper assignment for this course.

Document #2 — evidence of your experience with data manipulation and analysis, which most often would be fulfilled with a course paper or conference paper that demonstrates such skills either directly or indirectly.

Document #3 — a formal letter written by you, addressing in a comprehensive manner each of the following points in appropriately labeled sections:

1. A clear rationale for why the learning objectives of this course, as well as your short- and long-term educational and professional goals, will be fulfilled more completely in your case by the use of your preferred dataset instead of the course dataset.

2. A detailed description of the dataset, including (but not limited to):
   a. the topic that the data address,
   b. the units of which the data are composed,
   c. the nature and size of the population from which units were selected for inclusion in the data,
   d. how units were selected for inclusion in the data,
   e. when, where, how, and by whom the data were collected,
   f. the period of time addressed by the data,
   g. the variables contained within the data,
   h. the number of cases in the data,
   i. the population to which reasonable inferences may be made from the data,
   j. any adjustments to the data that are necessary to make statistically sound inferences (e.g., the application of a sampling weight),
k. any security restrictions or confidentiality restrictions that are placed on the use of the data, and
l. any other information that would be necessary to understand the nature of these data.

3. A detailed description of the variables that you intend to use to complete the final paper assignment, including (but not limited to):
   a. the underlying concept that each of these variables is intended to measure,
   b. the level of measurement of each variable,
   c. how these variables will be used to fulfill the particular requirements of the final paper assignment (see the “Requirements” section),
   d. the number of cases that have missing values on each variable,
   e. the number of cases remaining in the dataset after the elimination of cases that have missing values on any of the variables that you intend to use the complete the final paper assignment,
   f. Stata output of descriptive statistics and frequency distributions for each variable,
   g. any other information that would be necessary to evaluate the fit of your preferred variables with the requirements of the final paper assignment.

4. A statement of your understanding that the teaching team for this course will be able to provide only minimal assistance with any data-related problems that you may experience in the use of your data to fulfill the requirements of the final paper assignment.

To reiterate, to request consideration of a waiver of the requirement to use the course dataset for the final paper assignment, you must submit all three of the documents described above to the Professor as attachments to a single email.