Psychology 203: Introduction to Statistics for Psychology
Bard College, Fall 2013
LECTURE: Monday, Wednesday 1:30-2:50 – RKC 103

LAB SECTIONS	
Attend assigned lab section in Old Henderson 101A	Tuesday 10:30-12:30 Tuesday 1:30-3:30

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Office Hours: Monday 3:00-4:00; Wednesday 11:30-12:30

Course Assistants (Office Hours in Preston 127):
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Office Hours: Thursday. 3:30-5:30

Course Overview

From the course catalogue: This course provides an introduction to the concepts and methods of statistics and is aimed at helping the student to gain a fundamental understanding of the tools needed to understand and conduct research in psychology. Topics to be covered include frequency distributions and probability, descriptive statistics, simple correlation and regression, sampling distributions, t-tests and basic and factorial analysis of variance. Non-parametric tests such as Chi-square will also be introduced. The course will focus on the interpretation and communication of statistics, and we will work with the SPSS software package to analyze data. This course is the first of a two-course sequence in statistics and research methods that is required of all prospective psychology majors. The course is ordinarily taken in the first semester of the sophomore year. Prerequisite: Introduction to Psychological Science or its equivalent.

Lengthier description.

[S]TATISTICAL THINKING WILL ONE DAY BE AS NECESSARY FOR EFFICIENT CITIZENSHIP AS THE ABILITY TO READ OR WRITE. – H. G. Wells, *circa* 1930

Have we arrived at the moment in time at which being able to think statistically is a requirement to be a good citizen? Perhaps; perhaps not. But we have almost certainly arrived at a point when being educated in the use (and, yes, misuse) of statistics is an advantage in navigating a data-rich world. Statistics are fundamentally a tool for answering questions, and they are the most powerful tool in the psychologist's toolbox. A fundamental grasp of statistics is essential to understanding the research you will encounter in your Upper College coursework, and to conducting your own independent research.

In this class, we will cover the conceptual and mathematical ideas underlying inferential statistics (those from which we can draw, as the name suggests, inferences). The course is intended to be a blend of both the theoretical (you should understand how statistical analyses work and why different ones are appropriate in different situations) and the practical (we will have practice conducting analyses in SPSS, a popular software package). In all cases, we will try not to lose sight of the fact that statistics in psychology are fundamentally a way of answering questions, and those questions should remain at the forefront of your mind throughout the course.

Materials

Aron, A., Aron, E., & Coups, E. J. (2012). *Statistics for psychology* (6th ed.). Upper Saddle River, NJ: Pearson/Prentice-Hall.

Kirkpatrick, L.A., & Feeney, B.C. (2011). *A simple guide to SPSS* for Versions 18.0 and 19.0. Belmont, CA: Wadsworth.

The following readings are posted on Moodle:

Gould, S. J. (1985). The median isn't the message. *Discover Magazine.*

Graziano, A. M., & Raulin, M. L. (2010). *Research methods: A process of inquiry* (7th ed.). Boston: MA: Allyn & Bacon. Chapter 12: Factorial Designs (pp. 247-260).

Jackson, S. (2009). *Research methods and statistics: A critical thinking approach.* Belmont, CA: Wadsworth. Chapter 6: Correlational Methods and Statistics (pp. 141-143).

Lamberth, J. L. (1998, August 16). Driving while black: A statistician proves that prejudice still rules the road. *Washington Post.*

Lecture slides: I will distribute templates of the lecture slides to be used in class each day. I suggest you take notes on these sheets, which will have some information already included (such as the data that we're working with) and will leave you free to digest the material and take thoughtful notes rather than scrambling to get all of the numbers or figures copied down.

Approaching the reading: My suggestion for reading for this class is quite different from how you may be used to preparing for classes. I think it is most useful to skim the relevant material before lecture and to become acquainted with the big ideas. After the material is presented in class, I suggest then going back to read the chapter in close detail, stopping to work out the problems interspersed throughout the chapter.

A calculator that can: add, subtract, multiply, divide, has an eight digit display, memory, and a key for $\sqrt{}$ (X^2 is nice but not necessary). **Graphing calculators and cell phone calculators are not permitted for exams.** Bring this to each class session and be sure that you have a functioning calculator before the exams!

Course materials. There will be a lot of handouts and things to print in this class - you should get a binder in which to keep all these materials and bring it to each class.

- Additional readings (see schedule)
- Worksheets and handouts for lab sections
- Formulae, flowchart and important tables – handed out the first day. Bring to every class.
- Lecture templates

Moodle. We will use a Moodle course site to share information and thoughts. Make sure you add the class on Moodle – the course code is **correlationF13**.

Policies

Attendance. Lecture attendance will be noted but your grade will not be formally penalized for missing class. However, because of the nature of the material, it is highly likely that absences will incur a *de facto* penalty come exam time, because it is difficult not to attend class and do well on the tests. This class moves at a rapid pace and material that is missed due to absence will not be repeated in lecture. Similarly, office hours will not be used to replicate the class lecture. Lab attendance will be taken and consistent absences will negatively affect your grade.

We are a big class: Late arrivals are disruptive to the class as they come in, look for a seat, and make their way to it. Consistent patterns of lateness will be addressed and potentially penalized. Please be on time.

Plagarism. Exams and the written paper are to be completed independently. The homework assignments may be worked on with peers. Study groups are an excellent way to learn material, but take care to ensure that by the end of your group sessions, you can respond to the homework questions independently. Violations of the guidelines of academic integrity will result at a minimum in loss of credit for the assignment, and may result in failure in the course.

Cell Phones and Laptops. Please turn off all cell phones before class; no laptop computers are allowed in the Monday/ Wednesday sessions.

Late Assignments. Late assignments will immediately lose 10% of their grade, and another 5% for every additional day late.

Assessment

If you need a special accommodation for the exams or any other aspects of the course, please speak with me after the first class.

NOTE: THE FINAL EXAM IS THREE HOURS ON A SATURDAY FROM 1-4PM. PLEASE PUT IT IN YOUR CALENDAR RIGHT NOW AND LET ME KNOW IF YOU HAVE A CONFLICT

Midterm exams (2 midterm exams, 20% each). Non-cumulative.

Final exam (25%). Cumulative.

Each exam will be comprised of two parts: an in class-written exam that will present an opportunity to show mastery of the underlying concepts and theories, and a practical exam that will allow you to demonstrate your ability to perform and interpret the statistics we have discussed. Written exams are closed-book; lab exams are open-book, open-note, open-everything-but-another-person. For the two mid-term exams, you may bring *one* 4"x6" index card with notes. For the final exam, you may bring *one* 8 ½ x 11" sheet of paper with notes.

Quizzes. (15%). There will be 13 quizzes throughout the semester posted to Moodle. Your 10 best grades will contribute to your final class grade. Quizzes must be taken within 24 hours of completion of the material marked with ** on the syllabus. Each quiz is open-book and is comprised of questions randomly selected from a larger set of questions (so each student will have a different quiz).

Final paper (10%).

The final paper is your opportunity to put the analytical skills that this class is designed to develop to use: In this paper, you will critique the results section of a published paper. More details are below.

Group project (10%).

You will complete a small group presentation. More details are below.

Problem sets (Self-assessment).

I will provide problem sets for each topic: these will not be graded, but will be an opportunity for you to assess your mastery of the material. The textbook has many, many more questions with answers in the back. You should do as many as it takes to feel comfortable, and feel free to ask me for even more!

Final grades.

Grades will be assigned according to the schedule below (plusses and minuses will be assigned at the top and bottom of each range). I reserve the right to change the grading scale ONLY in a way that will help you – that is, the cut-off for the A-rage could drop to (for example) a 88%, and other cutoffs would change accordingly. I will never change the grading scale in a way that would make it more difficult to get a higher grade.

A-range	90-100%	D-range	65-70%
B-range	80-90%	F	Below 65%
C-range	70-80%		

Schedule

(N.B. It is more important to cover material thoroughly and make sure the majority of the class understands it before proceeding to the next session. The schedule maybe adjusted to move more quickly or slowly as needed, but it is unlikely that exam dates will change.)

AAC = Aron, Aron & Coups; KF = Kirkpatrick & Feeney; M= posted on Moodle

September 2	Monday	Introduction to the Course	No reading
September 3	Tuesday	No Lab Meeting	No reading
September 4	Wednesday	Basic Concepts**	AAC Chapter 1; pp. 84-89
September 9	Monday	Measures of Central Tendency	AAC Chapter 2 (pp. 34-43)
September 10	Tuesday	Introduction to SPSS	KF: Chapters 1-5 M: Lamberth (Driving While Black)
September 11	Wednesday	Variability**	AAC Finish Chapter 2
September 16	Monday	z-scores and Probability**	AAC Chapter 3
September 17	Tuesday	Descriptive Statistics and z-scores in SPSS	KF Chapter 6 M: Gould (The Median isn't the Message)
September 18	Wednesday	Hypothesis Testing	AAC Chapter 4 (pp. 108 - 119)
September 23	Monday	Hypothesis Testing**	AAC Finish Chapter 4
September 24	Tuesday	Start Group Project	No reading
September 25	Wednesday	Testing Hypotheses with means of Samples	AAC Chapter 5 (pp. 139 - 148)
September 30	Monday	Testing Hypotheses with means of Samples**	AAC Chapter 5 (pp. 148 - 163)
October 1	Tuesday	Finish Group Project	No reading
October 2	Wednesday	Type I and Type II Errors	AAC Chapter 6 (pp. 177 - 188)
October 7	Monday	Power and Effect Size**	AAC Chapter 6 (pp. 188-216)
October 8	**Tuesday**	**LAB EXAM 1**	
October 9	**Wednesday**	**EXAM 1 (WILL NOT INCLUDE POWER AND EFFECT SIZE)**	
October 14	Monday	FALL BREAK - NO CLASS	
October 15	Tuesday	FALL BREAK - NO CLASS	
October 16	Wednesday	t-tests for a single sample	AAC Chapter 7 (pp. 226 - 240)
October 21	Monday	t-tests for dependent means**	AAC Finish Chapter 7
October 22	Tuesday	t-tests in SPSS	KF Chapters 7 and 9
October 23	Wednesday	t-tests for independent means	AAC Chapter 8 (pp. 275 - 293)
October 28	Monday	t-tests for independent means**	AAC Chapter 8 (pp. 293 - 299)
October 29	Tuesday	t-tests for independent means in SPSS	KF Chapter 8
October 30	Wednesday	One-way Analysis of Variance (ANOVA)	AAC Chapter 9 (pp. 316 - 337)

November 4	Monday	One-way ANOVA**	AAC Chapter 9 (pp. 337 - 351)
November 5	Tuesday	One-way ANOVA in SPSS	KF Chapter 10
November 6	Wednesday	No Class	
November 11	Monday	Factorial ANOVA and Interactions**	M: Graziano & Raulin (Factorial Designs)
November 12	Tuesday	Understanding Interactions	
November 13	Wednesday	Catch Up/ Review	
November 18	**Monday**	**EXAM 2**	
November 19	**Tuesday**	**LAB EXAM 2**	
November 20	Wednesday	Chi Square Goodness of Fit	AAC Chapter 13 (pp. 542 - 553)
November 25	Monday	Chi Square Test of Independence**	AAC Finish Chaper 13 (Skip box on "Controversy: The Minumum Expected Frequency")
November 26	Tuesday	Chi Square in SPSS	KF Chapter 17
November 27	Wednesday	THANKSGIVING - NO CLASS	
December 2	Monday	Correlation**	AAC Chapter 11
December 3	Tuesday	Correlation in SPSS	KF Chapter 14
December 4	Wednesday	ADVISING DAY - NO CLASS	
December 9	Monday	Regression**	M: Jackson (Correlational Methods and Statistics; pp. 125-end)
December 10	**Tuesday**	**LAB FINAL EXAM**	
December 11	Wednesday	Catch Up/ Review	
December 14	**Saturday**	**FINAL EXAM, 1:00-4:00**	*****NOTE THIS IS A SATURDAY*****
December 20	**Friday**	**FINAL PAPER DUE**	**Final paper due 5pm**

Small Group Project: Analysis of a Media Summary of a Research Report

Goals: Any psychology student ought to be able to read reports of scientific research with a critical eye – students who have mastered the basics of the discipline should be able to provide a careful analysis of original research reports and secondary reports of those findings (which are commonly, and, somewhat frequently, inaccurate). This assignment is designed to build on those skills. This assignment also provides an opportunity to practice communicating your analytical findings orally, and to work in a collaborative setting.

Overview: In pairs or triplets, you will find a newspaper or magazine article that reports some social science finding that is of interest to you. You should then locate the primary source of the report.

Finding an article: The results of psychology and other social science studies are frequently reported in the media. You should find one such recent article. You can start with the Science section on the *New York Times* or recent editions of popular newsmagazines such as *Newsweek* or *Time.* You will look for the article in your groups in lab and must have them approved by me before you leave. You should make sure that you have access to the original source article as well. No group will report on the same article.

Work time: We will begin this project in lab on September 24; your presentations will be the following week during lab. You will need to meet with your group members outside of lab time to finish the assignment.

The oral report: In pairs, you will have 15 minutes during lab to provide an oral report of the media report and original source article. (You will be stopped after 15 minutes even if you have covered all of your intended material.) You should be sure to cover the points below during your presentation. The key to a good presentation is to practice it. Each group should convene between the lab sessions to ensure that the presentation is organized and engaging. You may (and are encouraged) to bring handouts or use visual displays for your presentation. If you choose to use a multimedia source such as Powerpoint, you must upload it to Moodle by 10pm on Monday evening.

Questions to be addressed in the oral report:

- Provide a synopsis of the research study – be sure to identify the main research question, to briefly summarize the methods, and to state the main result. Be sure to explain, as clearly as you can, the procedures that the authors used to test their questions.

- You should also address the following specific questions in your report:
    - How accurately does the title of the media report reflect the findings of the study? If you were the writer, what title would you use? (Remember that a newspaper or magazine's goal is to attract readers, so it should be catchy as well as accurate.)
    - How accurately does the media report overall reflect the findings of the study?
    - If you could change one sentence in the article, which would you change, and what would be your reasons for changing it?
    - What information would add to the media report if you were reporting on the scientific finding? Explain your reasons for including this information.
    - Comment on the figures included in the media report. Are there more compelling ways to display the data?

- You should submit the following via Moodle (only one person in your group needs to hand it in):
    - A summary Word document that includes the name of your group members, and the reference for the media report and original article that you used. Below the reference, you should copy and paste the text of the media report

Paper Review Assignment

In your final paper, you will analyze the data analysis reported in a published psychology journal article. This assignment has three primary goals.

1. *Be a Consumer!* In class and on exams, you have the opportunity to show that you understand statistics (on the written tests) and can use this knowledge on primary data sets (on the lab tests). You will often be a consumer of statistics who reads reports of others' research. In reading these articles, it is crucial to understand and evaluate how the conclusions were derived, and to evaluate independently whether you accept their claims. On this assignment, you will be an active (and somewhat skeptical) reader, and provide your analysis of the report of the data analysis and presentation.
2. *Simulate the Peer Review Process.* Peer review is the primary mechanism by which papers in Psychology are published. It is the 'gatekeeper' of the academic world, and aims to ensure that published work meets high standards. In the typical case, a paper is submitted to a journal, and an editor solicits reviews (usually anonymous) of the paper from experts, who provide a recommendation about whether or not the paper ought to be published. In addition to this recommendation, the goal of a review is to improve the paper – either for final inclusion in that journal, or to strengthen it for submission to another outlet. This process is a crucial responsibility of the professional researcher, and this assignment will give you a flavor for how this process works.
3. *Prepare you for Moderation.* Psychology moderators write a paper that summarizes and evaluates a psychology journal article Part of your analysis should focus on the appropriateness of the analyses given: 1. the hypothesis being tested, 2. the study design, and 3. features of the data set. This assignment will prepare you for Moderation Saturday!

Assignment

You will critique the article in your reader: the analysis will focus on the results section and reporting of the results. In 3-4 pages, you should:

1. **Briefly** (1-2 paragraphs) summarize the research goals and method. Assume the reader is a psychologist unfamiliar with the paper.
2. Summarize the analyses conducted. Be sure to state the null hypothesis (or hypotheses) even if the paper does not do so explicitly.
3. The bulk of the paper will be spent on your critique. What you choose to focus on is up to you, but some suggested directions are:
    a. *Analyses.* Were the analyses appropriate – given their data, would you have conducted different analyses on these data?
    b. *Presentation.* Was the presentation of the results clear? Could the paper have benefited from other – or different – tables or figures that would have made the findings more clear? Were any figures or tables accurate representations of the findings?
    c. *Inferences.* Are the conclusions drawn from the analyses reasonable?

Other Guidelines

The paper should be between 3-4 double-spaced pages, and written in clear language. You can choose to organize your argument however you wish, but there should be a logical order to the paper. Be sure to include an introduction and conclusion to your main argument.

Citations should be in APA format, and the paper should include a Reference list. You must work independently on the paper, but you are welcome to consult with me and/ or the Course Assistants as you work on it. You are free to refer to any sources that you find useful. Be sure to cite any sources that you use.

Suggestions (Lessons Learned)

In the past, the strongest papers have focused on two or three issues in the analysis section, and fully developed and explained these issues. One “danger zone” is to analyze the research methods rather than the data analysis and statistics. Don’t do this – you’ll have plenty of time to think about methods next semester!