

Psychology 2030: Methods and Statistics

Psychology 2030 is intended as a *gentle* introduction to the scientific methods and statistical techniques commonly used in psychological research. Emphasis is on these methods and statistics as ways of thinking about observations and phenomena, rather than on the blind application of research designs and mechanical aspects of calculation. An ability to read and to understand the original scientific literature is the ultimate goal; comprehension of research designs and statistical methods as tools as opposed to virtuosity with a hand calculator/computer program and mystical equations is the proximate goal. To that end, lectures and discussion will critically examine statistical thinking in the context of quotidian (or spectacular) claims in medicine (e.g., the benefits of "screening", interpreting test results, claims for the efficacy of "alternative" medicine, etc.), epidemiology, law (e.g., the reliability of fingerprint identification, DNA "fingerprinting", etc.), and so on. Many may find that these discussions challenge one or another of their core beliefs, or even the medical regimen of a relative, friend, or themselves. Good. How to mount these challenges and to engage in critical thinking about such everyday claims represent the fundamental "take-home" messages of the course.

Textbook

The other critical aspect of the course is the introduction to statistics as used by experimental psychologists. As such, the emphasis is on the use of statistical techniques as actually occurs in experimental psychology, rather than on an introduction to statistics as a mathematical discipline. All of the materials for this aspect of the course, and some others (e.g., writing in APA style), have been collected into a book by John R. Vokey and Scott W. Allen, entitled *Thinking With Data (Sixth Edition)*. This book is available at the cost of printing and distribution from the bookstore (in a nicely-bound, double-sided format). The latest, hyperlinked, digital version of the book is *always* available in portable document format (pdf) on the web at: <http://people.uleth.ca/~vokey/pdf/thinking.pdf>, and changes as whimsy hits us (or students uncover errors or infelicities of prose). The printed version also has a drawing of a *platypus* on the cover (a pathetic attempt to mimic [O'Reilly Books](#))---what could be more cool than that?

Evaluation

Evaluation will consist of *three take-home exams*, each worth 1/3 of your final grade, and made available via the web and e-mail. The first of these will be made available Thursday, October 4, 2012 to be submitted no later than the following class, **Wednesday, October 10, 2012**; the next will be made available on Thursday, November 1, 2012 to be submitted the following class, **Wednesday, November 7, 2012**; and the final will be made available Thursday, November 29, 2012 to be submitted to the course drop-box in the Psychology Department no later than **Wednesday, December 12, 2012**. Each take-home exam will consist of ten, short-answer questions, of which you choose 6 to answer. The values in the following conversion table will be used as a guideline to convert scores out of 100% to minimum letter-grades, although the instructor reserves the right to adjust individual grades *upward* to reflect such aspects of performance as a marked improvement over the semester.

| Score | Grade | Score | Grade | Score | Grade | Score | Grade |
|--------|-------|-------|-------|-------|-------|-------|-------|
| 90-100 | A+ | 77-80 | B+ | 67-70 | C+ | 57-60 | D+ |
| 85-90 | A | 73-77 | B | 63-67 | C+ | 50-57 | D |
| 80-85 | A- | 70-73 | B- | 60-63 | C- | < 50 | F |

Experimental Research Participation

This course is designed to provide students with an opportunity to participate in active research programs of faculty members. This participation allows you to get direct experience in how many of the experiments and studies you will read and hear about are actually done, and provides an opportunity for you to see what goes on in the labs, and meet senior undergraduate and graduate students conducting their own laboratory research projects. Calls for volunteers to assist in these projects will be made during the semester, via e-mail. If you are asked to volunteer, and you accept, each project usually requires typically less than one hour of your time, but the exact time commitment will depend on the individual research project. In recognition for your time, and in recognition that you are learning something about the discipline of psychology, beyond what you would in the normal classroom environment, an extra credit of 1% for each study in which you participate will be added to your total grade to a maximum of 5% (so, it is theoretically possible to score 105%). Note that there is *no* guarantee that all students will be able to achieve the maximum extra credit. As these are *extra* credits, students who choose not to participate are not disadvantaged.

Questions and Discussion

Preferably, *all* questions and discussion about the course material should occur during class time, including questions and discussion about the exams, so that all students benefit from the discussion. The first part of each class has been explicitly set as a question and answer period, although students are encouraged to ask questions at anytime during the class. This dialogue is especially important as we meet only once a week. In addition, students are encouraged to post questions and commentary to the class email list: <psyc2030n@uleth.ca>, both to provoke discussion, and to receive clarification (if needed) from the instructor and the TAs for the course; doing so will most often result in a prompt and considered response. Grades and various supplementary materials will be made available via Moodle <<https://moodle.uleth.ca>>, so be sure to familiarize yourself with the system.

Calculator

A good hand-calculator will prove useful for the course. At a minimum (beyond the standard arithmetical functions), the calculator must have a *square-root* function. More sophisticated functions, such as summation, factorial, permutations and combinations, standard deviation, correlation, etc., may prove useful, but are not essential. As most of you no doubt have a personal computer (or other “app” device), the software calculator on it is probably more than adequate. Similarly, any and all of the statistics discussed in the course may be conveniently calculated via a computer spreadsheet, but, again, a spreadsheet program/app is not essential.