PSYC2012
Statistics & Research Methods for Psychology

Unit of Study Code: PSYC2012

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Format of Unit:
2 x 1 hour lectures/week x 13 weeks (Statistics)
1 x 1 hour lecture x 6 weeks (even weeks: Research Methods)
1 x 1 hour STA tutorial/week x 12 weeks
1 x 1 hour COM computer tutorial x 6 weeks (alternate weeks)

Tutorial sizes: maximum of 22 students per group

You need to attend both your weekly statistics (STA) tutorial and your fortnightly computer (COM) tutorial. You will be allocated to either EVEN or ODD weeks for your computer tutorial by the University Timetabling Unit. Tutorials and Research Methods lectures commence in week 2, on EVEN weeks.

Credit Point Value: 6 Credit Points

Prerequisite: 12 credit points of First Year Psychology including PSYC1001 and PSYC1002

Assumed Knowledge: HSC Maths, any level

Assessment:
30% Tutorial Tests (open book)
Held in weekly tutorials in Weeks 4, 8 and 12

20% Midsemester examination (computerized multiple choice). Held in weekly tutorial in Week 9.

10% Group project, 1,000 words; Due week 13

40% Final examination - multiple choice questions; closed
The final grade will be determined on the basis of total scaled marks across the various assessments, appropriately weighted, and ALL of which are counted.

**Unit of study general description:**

In this unit of study you will be introduced to some of the basic concepts of statistics and statistical inference, and research design, as applied in psychological research. The aim of the course is to develop your ability to understand the published research literature, to design and plan research questions with a clear idea of how to test the questions of interest, and to become critical consumers of any sort of statistical information. Your introduction to the computer package SPSS is designed with the goal of making you informed users of the technology. To encourage you to maintain the required level of application, assessments will be carried out regularly.

**Graduate Attributes and Student Learning Outcomes for Statistics & Research Methods for Psychology (PSYC2012):**

*This course is structured around the graduate attributes associated with the scientist-practitioner model, the basis for the training of psychologists in Australia and internationally.*

Graduate Attributes are the generic skills, abilities and qualities that students should acquire during their university experience and the School of Psychology is committed to providing an environment to promote these skills. In addition, this unit of study will provide students with generalised and transferable skills that will also be useful in careers outside psychology.

The following graduate attributes and student learning outcomes will be developed through lectures, tutorials and assessment activities in particular. Assessment is continuous and varied to enable students to demonstrate their understanding of all aspects of the unit of study. The assessment targets all the elements of the attributes.

2: Knowledge and Understanding of research methods within Psychology
Understand, apply and evaluate basic research methods in Psychology.

**Student learning outcomes:**
- describe the basic characteristics of the science of psychology
- describe, apply and evaluate the different research methods used by psychologists (assessed in reports, quizzes and exams)
- demonstrate practical skills in laboratory-based and other psychological research

3: Critical Thinking Skills in Psychological research
Respect and use critical and creative thinking, skeptical inquiry, and the scientific approach to solve problems related to thought and behaviour.

**Student learning outcomes:**
- apply knowledge of the scientific method in thinking about problems related to behaviour and mental processes using repeated class exercises and examples (including tests)
- question claims that arise from myth, stereotype, pseudoscience or untested assumptions by emphasizing tools to test such assumptions (assessed in exams and quizzes)
- recognise and defend against the major fallacies of human thinking such as graphical misrepresentations and overemphasis of mean compared to variance measures.

4: Values, research and professional ethics
Student learning outcomes:
• use information in an ethical manner (e.g., acknowledge and respect work and intellectual property rights of others through appropriate citations in oral and written communication) by evaluation of appropriate references to others’ work in written communications such a group research report.

5: Communication Skills in statistics and research methods in Psychology
Communicate effectively in a variety of formats and in a variety of contexts

Student learning outcomes:
• write a group research report using American Psychological Association (APA) structure and formatting conventions

SYLLABUS

Descriptive statistics: Measures of central tendency and variability. Effects of transformation on a set of scores. Finding areas under the normal curve.

Inferential statistics: Formulating hypotheses for tests of statistical significance for a single mean, using z and t-tests; for 2 related means and for 2 independent means using t-tests. Analysis of variance and follow-up tests for tests about means with two or more groups. Looking at relationships between two continuous variables: correlation. Factors affecting correlation. Testing correlation coefficients for statistical significance. Simple linear regression. Categorical data: tests for frequency data using the chi-square statistic. Effect size measures for different statistics.

Research methods: understanding the problems of designing experiments to answer specific questions, and limitations in the conclusions that can be drawn.

TIMETABLE*

<table>
<thead>
<tr>
<th>WEEK</th>
<th>STATISTICS LECTURES</th>
<th>RESEARCH METHODS</th>
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<tbody>
<tr>
<td>1</td>
<td>Descriptive statistics: central tendency and variability</td>
<td>No lecture</td>
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<tr>
<td>2</td>
<td>Standard deviation, z scores, normal distribution</td>
<td>Variables and Relationships</td>
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<tr>
<td>3</td>
<td>Hypothesis testing; sampling distribution of the mean</td>
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<tr>
<td>4</td>
<td>Hypothesis testing: z &amp; t test for a single mean</td>
<td>Research Designs</td>
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<tr>
<td>5</td>
<td>Parameter estimation; statistical power</td>
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<tr>
<td>6</td>
<td>t-tests for related and independent samples</td>
<td>Internal and External Validity</td>
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<td>7</td>
<td>Analysis of variance - one-way</td>
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<tr>
<td>8</td>
<td>Analysis of variance - two way</td>
<td>Artifacts and bias in behavioural research</td>
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<td>9</td>
<td>Correlation</td>
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<tr>
<td>10</td>
<td>Simple Linear Regression</td>
<td>Controlling Extraneous Variables</td>
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<td>11</td>
<td>Chisquare tests for categorical data</td>
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<tr>
<td>12</td>
<td>Applications: choosing appropriate tests</td>
<td>Applications: Reading Research Critically</td>
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<tr>
<td>13</td>
<td>Overview and revision</td>
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* For more information, see Program available on web

EQUIPMENT

Students will need a calculator, to be brought to all tutorials. The calculator should have statistical functions; the calculators used in secondary school mathematics courses will be
quite suitable. Students may also find it useful to have a USB memory stick for saving assignment and tutorial data.

TEXT
NOTE: Two versions of the Howell text are available, only one of which is needed. For those students who have done no statistics before (Psych. 1 not included) and are apprehensive, the ‘Fundamentals’ book is recommended. For those who have some statistical training, the ‘Methods’ book is more advanced and a valuable reference for further study in Psychology. Earlier editions of the textbooks are suitable.

EITHER

OR

OTHER REFERENCES
The following may be useful for supplementary reading and exercises in statistics:
Howell, D.C. Statistical methods for psychology (earlier editions than 8th ) Belmont CA: Duxbury.

For Research Methods, a useful reference is:

For Using SPSS, a useful reference is:

See also information about links to Statistics on the WWW on the eLearning site.

SOFTWARE
Purchasing SPSS software is not essential for PSYC2012 (but if money is no object, it might be recommended for those wishing to continue with Psychology. Note however that recent licencing arrangements for students are not generous, and from V19 only one year licences are available). There are 2 versions that can be purchased at the Co-Op bookshop: the Standard Graduate pack, a fully-functioning version of SPSS (recommended) and the Base Graduate pack (formerly known as Student version), a cut-down version that is less expensive and is suitable for PSYC2012, but not for 3rd year and beyond [there is also a Premium version available – you definitely do NOT need that]. SPSS is now up to version 20 (or is it still 19?), but earlier versions are more than adequate. More details will be given in the first lecture and on the web.

Academic Dishonesty and Plagiarism

1. It is your responsibility to know what academic dishonesty and plagiarism are.

   Here is the link to the University’s policy:

Make sure that you understand what counts as academic dishonesty and the various types of plagiarism. The Library’s http://www.library.usyd.edu.au/skills/ ‘Plagiarism and Academic Honesty’ program will help.

2. Note that:
   
i) The School of Psychology will penalise all submitted work that is plagiarised.
   
   ii) Students should note that all assignments (including group projects) will be run through similarity detecting software. This software detects similarities between (a) your assignment and both print and online sources, and (b) assignments submitted by other students, from both current and previous years. If similarities are found, they will be investigated so as to determine the nature of the plagiarism. See Part 5 of the University's policy.

Avoiding plagiarism – key points

• Plagiarism is a serious offence and may result in failure in the course. Even where students are completing an exercise together, each student must submit separate written work. Incorporation of any material from another student’s assignment is regarded as plagiarism.

• In writing essays or reports to meet coursework requirements, you should use your own words. In some contexts (e.g., theoretical research) it is appropriate to use an occasional quotation. This should be indicated in the conventional way by enclosing the passage within quotation marks and by providing a precise (page number) reference for the source of the quote. In many contexts, especially reports of empirical work, quotations are best avoided.

• “Using your own words” means that you should not borrow from the writing of others – whether from fellow students or published authors. For example, it is not acceptable to base an essay on text from various sources that you have then edited to some degree – even if you cite these sources. First of all, there is the ethical issue arising from the dishonesty of presenting as your own work something which is essentially the work of others. In addition, there are good educational reasons for avoiding this, even where you feel that someone else has expressed some idea far more clearly than you could. One reason is that you must learn to express yourself clearly in writing; like most other skills, this only comes with practice. Another, is the failure to understand information or ideas at all thoroughly if all you have done is reproduce (with some editing) what someone else has written about the topic.

• When you express in your own words what you have learned from various sources, you should cite each source. The standard convention for most written work in psychology is to list references at the end of your essay or report, rather than, for example, to use footnotes. To express some idea without giving a citation implies that it is your own idea. Therefore, if it is in fact an idea obtained from someone else, this needs to be acknowledged. Listing a set of sources implies that you have read them all. Therefore, you should list as references only those you have actually read. If you are depending on a secondary source, then make this clear, e.g., ... salivary conditioning (Pavlov, 1927; cited in Mazur, 1998).

• The points made here also apply to non-textual material. For example, graphs or tables of data included in a report should be your own work and not copied from others. Very occasionally you may need to 'quote' a figure from some other source; if you do so, you should make its origin quite clear.
• In general, avoid letting other students use your work for any kind of assessment. On the rare occasion where this may be appropriate, make sure that the other student acknowledges your contribution as the original author.
• In some cultures, students show their respect for a teacher by copying what the teacher has said or written. In Australian University education, copying a teacher (even if paraphrasing) is plagiarism if the source is not cited.

Research and resource support for Psychology students

The University of Sydney Library has 12 libraries in different locations, on different subjects with different facilities. Fisher Library is where you will find the physical collection of most relevance to your Psychology studies. Fisher Library is located on Eastern Ave, Camperdown campus. We also have loads available online – find us at sydney.edu.au/library/

Matthew Davis is the Faculty Liaison Librarian for Psychology. Matthew is available to help you find and use library resources for your assignments or research. You can email him at library.psychology@sydney.edu.au <mailto:library.psychology@sydney.edu.au> or phone on 9351 3629. The Psychology Librarian is located at Badham Library, level 1, Badham Building, Science Rd, Camperdown Campus.

Psychology books in high demand

The 2 hour collection is located on Level 3 of Fisher Library. Most of your required and recommended items from the reading lists will be here. You can find a list of your required readings in the catalogue by searching under your Unit of Study code http://opac.library.usyd.edu.au/search/r

Some material in the list is also available to read online.

Psychology subject guide

There is a comprehensive subject guide that includes links to psychology databases, internet resources, information on tests and measurements, referencing guides, and much more. Take a look at http://libguides.library.usyd.edu.au/psychology

You can also enrol in free research, database and EndNote training classes on this site.

Need a refresher after the long vacation?

Watch and listen to these online learning objects and get back up to speed with information literacy skills on topics such as research, essay writing and referencing. http://www.library.usyd.edu.au/skills/