

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 20 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, an EVEN week.

Credit Point Value: 6 Credit Points

Prerequisite: 12 credit points of First Year Psychology including PSYC 1001 and PSYC 1002

Assumed Knowledge: HSC Maths, any level

Assessment: 20% Tutorial Tests (open book)
Held in weekly tutorials in Week 4 and Week 12

25% Midsemester examination (computerized multiple choice & written). Held in weekly tutorial in Week 9.
Students will be able to take in one A4 page of information which is not to be removed from the tutorial room.

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

45% Final examination - multiple choice questions; closed book; held during the examinations period

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.

1: Knowledge and Understanding of the application of statistics within Psychology

Student learning outcomes:

- calculate and interpret descriptive statistics such as measures of central tendency and variability
- demonstrate understanding of graphical and tabular representations of data, and be able to use statistical tables (which will be provided)
- demonstrate the ability to formulate and carry out significance tests for statistical hypotheses appropriate to a variety of research situations
- be able to compute and interpret confidence intervals and other effect size indices
- understand the limitations of, and possibility of errors in, statistical inference
- be able to carry out appropriate statistical tests on computer using SPSS, as taught in tutorials, and interpret the output accordingly

2: Knowledge and Understanding of research methods within Psychology

Understand, apply and evaluate basic research methods in Psychology.

Student learning outcomes:

- be able to give explicit descriptions of research designs
- demonstrate understanding of the appropriateness of a given research design
- critically evaluate published research and give possible alternative interpretations of research outcomes

3: Critical Thinking Skills in Psychological research

Respect and use critical and creative thinking, sceptical inquiry, and the scientific approach to solve problems related to thought and behaviour.

Student learning outcomes:

- demonstrate knowledge of the scientific method in thinking about the interpretation of statistical analyses of psychological research data
- apply and synthesise the material covered in a group research project which involves the analysis, reporting and interpretation of data
- evaluate the quality of information in published research

4: 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:

- Written assessments will be open book and will test the student's ability to carry out various procedures and to report the results appropriately.
- The group project is to encourage the ability to work collaboratively and effectively in groups; to manage conflicts appropriately and ethically; and to pool knowledge and abilities to produce a superior report of research and analysis, including a critique of published research.
- The midsemester examination, held in tutorials, is part multiple choice and part written. The final examination consists of multiple choice questions.

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 chisquare 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*

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

* For more information, see Program available on WebCT

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.

EITHER

Howell, David C. (2008) *Fundamental Statistics for the Behavioral Sciences*. (6th Ed.) Australia: Thomson/Wadsworth.

OR

Howell, D.C. (2007) *Statistical methods for psychology* (6th Ed.) Australia: Thomson/Wadsworth.

REFERENCES

The following have been texts in previous years and may be useful for supplementary reading and exercises in statistics:

Aron, A. and Aron, E.N. (1994). *Statistics for Psychology*. NJ: Prentice Hall.

Howell, D.C. *Statistical methods for psychology* (earlier editions than 6th) Belmont CA: Duxbury.

Minium, E.W., King, B.M. & Bear, G. (1993) *Statistical Reasoning in Psychology and Education*. 3rd Ed. New York: Wiley.

For Research Methods, a useful reference is:

Mitchell, M. and Jolley, J. *Research Design Explained*. Australia: Thomson/Wadsworth. (The most recent edition is 6th, but earlier editions are also adequate.)

SOFTWARE

Purchasing SPSS software is *not* essential for PSYC2012, but is recommended for students who intend to continue with the study of Psychology. There are 2 versions that can be purchased at the Co-Op bookshop: the **Graduate pack** comes with a 4 year licence and is a fully-functioning version of SPSS (recommended). The **Student version** is a cut-down version that is less expensive and is suitable for PSYC2012, but not for 3rd year and beyond. For students who are uncertain about whether they will continue, the Student version can be purchased very cheaply as a package with the text. There are Mac and PC versions of SPSS: in 2009, PC versions will be packaged with the text, and students requiring the Mac version can contact the publisher to exchange the PC version with a Mac version. There will be some text + Graduate Pack SPSS packages available also at the bookshop. More details will be given in the first lecture.

Plagiarism is not permitted

i) Are you sure you know what what plagiarism is?

Please refer to the University policy on plagiarism:

<http://www.usyd.edu.au/senate/policies/Plagiarism.pdf>

ii) The School of Psychology will severely penalise **all** submitted work that is plagiarised;

iii) The School of Psychology is using software to detect **all** forms of plagiarism (this will apply to your Group Project)

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Poppy Prezios is your Psychology Faculty Liaison Librarian. You can find her at Badham Library Ground Floor, Badham Building Science Rd, Camperdown Campus. You can phone her on 0434 606 913 or email at p.prezios@library.usyd.edu.au.

Psychology books in high demand Reserve (located on Level 2 of Fisher Library) is a 2 hour loan collection. Most of the required and recommended items will be here. Details of items required can be located in the catalogue.

<http://opac.library.usyd.edu.au/search/r>

Psychology Guide

includes links to Psychology databases, internet resources, information on tests and more.

<http://libguides.library.usyd.edu.au/psychology>

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