



Course Outline

PSYC3001

Research Methods 3

School of Psychology

Faculty of Science

Term 1, 2020

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1. Staff

Position	Name	Email	Consultation times and contact details
Course convenor, Lecturer	Dr Melanie Gleitzman	m.gleitzman@unsw.edu.au	By appointment and email Office: Mathews 1108. Phone: 9385 3019
Tutors	Dr Sonny Li (Head Tutor) Miranda Chilver	sonny.li@unsw.edu.au	

By appointment
and email.

2.1 Course summary

The course deals with various experimental designs involving between-subjects factors, for which some form of analysis of variance is an appropriate method of data analysis. Particular emphasis is placed on the use of simultaneous test procedures and simultaneous confidence intervals to produce coherent analyses of data from complex experiments.

Course Topics:

1. The two-group randomised experiment. Review of statistical inference on a comparison between two means: hypothesis tests and confidence intervals. Levels of inference: confidence interval inference, directional inference, inequality inference. Inferential error: Type I, Type II and Type III errors, non-coverage errors. Practical equivalence inference.
2. The problem of multiple comparisons with more than two groups. Monte Carlo sampling experiments. Logical and statistical dependence among comparisons. Error rate under per-comparison error rate and familywise error rate. Error rates for individual t test of maximal comparison when $J > 2$.
3. Controlling the familywise error rate for test of the maximal comparison. The Tukey (Honest Significant Difference) multiple comparison procedure (MCP) based on the range of means. Properties of the Tukey simultaneous test procedure (STP) and simultaneous confidence interval procedure (SCI).
4. Single factor fixed effects ANOVA model. Effect parameters, effect size and levels of inference. Partition of variation and degrees of freedom. The standard ANOVA analysis. Assumptions. Central and non-central F distribution. Heterogeneity inference.
5. Contrasts on effect parameters and population means. Simple and complex contrasts. Contrast statistics. The sampling distribution of the sample value of a single planned contrast. CI and directional inference on a single planned contrast. Unstandardised and standardised effect size. Scale of contrast coefficients.
6. Controlling the familywise error rate with the STP. The maximal contrast. The Scheffé SCI procedure. Coherence and consonance. Carrying out F -based analysis with PSY. Unstandardised and standardised CIs.
7. Planned vs post hoc analyses. Alternative to the STP for planned contrast analyses. The Bonferroni t procedure: tests and CIs on planned contrasts using PSY to carry out Bonferroni t analyses.
8. Simultaneous vs sequential MCPs. Comparison of simultaneous MCPs Scheffé, Bonferroni and Tukey procedures. Examples of sequential MCPs that do not control FWER. 'Protected' t -test procedures.
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12. Planned contrasts analysis of K factorial between-subjects design. Bonferroni t procedure for analysis of main effect and interaction contrasts.
13. Posthoc analysis of K factorial between-subjects design. Heterogeneity inference. C.T.P.s for main effect and interaction contrasts. Scheffé SCIs.
14. Planned and post hoc coherent analyses of K factorial designs allowing for inferences on simple effects. The

2.4 Relationship between course and program learning outcomes and assessments

Program Learning Outcomes				
	1. Knowledge	2. Research Methods	3. Critical Thinking Skills	4. Values and Et

3. Strategies and approaches to learning

3.1 Learning and teaching activities

The methods covered in this course deal with the analysis of data from *experimental designs*, which are often used in the subdisciplines of cognition, perception, social and developmental psychology, human and animal learning, and applied areas of psychology, and as such are relevant for the associated Level III Psychology Electives.

Course content for each topic will be discussed in Lectures, in the first instance, and in statistics and computing tutorials. Tutorials provide students with an opportunity to consolidate and apply their understanding of course material. Practice activities will be posted to Moodle on a regular basis.

3.2 Expectations of students

It is expected that students

- € are aware of UNSW Assessment policy and understand how to apply for special consideration if they are unable to complete an assignment/exam due to illness and/or misadventure;
- € have read through the [School of Psychology Student Guide](#)
- € undertake sufficient independent learning each week (recommended at least

Further information about referencing styles can be located at

	ELISE Turnitin Student Code of Conduct Policy concerning academic honesty Email policy UNSW Anti-racism policy UNSW Equity, Diversity and Inclusion policy
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8. Administrative matters

The [School of Psychology Student Guide](#) contains School policies and procedures relevant for all students enrolled in undergraduate or Masters psychology courses, such as:

- € Attendance requirements
- € Assignment submissions and returns
- € Assessments
- € Special consideration
- € Student code of conduct
- € Student complaints and grievances
- € Equitable Learning Services
- € Health and safety

It is expected that students familiarise themselves with the information contained in this guide.

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