PSYU3349

Design and Statistics III

Session 1, In person-scheduled-weekday, North Ryde 2022

School of Psychological Sciences

Contents

General Information

Unit convenor and teaching staff
Unit Co-convener
Alissa Beath
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Credit points
10

Prerequisites
((Admission to BPsych(Hons) and 60cp in PSY or PSYU or PSYX units at 2000 level including (PSY248 or PSYU2248 or PSYX248 or PSYX2248)) OR ((60cp from PSY234 or PSYU2234 or PSYX234 or PSYX2234 or PSY235 or PSYU2235 or PSYX235 or PSYX2235 or PSY236 or PSYU2236 or PSYX236 or PSYX2236 or PSY246 or PSYU2246 or PSYX246 or PSYX2246 or PSY247 or PSYU2247 or PSYX247 or PSYX2247 or PSY248 or PSYU2248 or PSYX248 or PSYX2248) and (30cp(Cr) from PSY234 or PSYU2234 or PSYX234 or PSYX2234 or PSY235 or PSYU2235 or PSYX235 or PSYX2235 or PSY236 or PSYU2236 or PSYX236 or PSYX2236 or PSY246 or PSYU2246 or PSYX246 or PSYX2246 or PSY247 or PSYU2247 or PSYX247 or PSYX2247 or PSY248 or PSYU2248 or PSYX248 or PSYX2248))

Corequisites

Co-badged status

Unit description
This unit builds on and unifies statistical and design topics introduced in previous units, particularly PSYU2248 Design and Statistics II. Topics include: repeated measures and mixed design ANOVA, multiple regression (linear, curvilinear, and logistic); analysis of variance and covariance; and model reduction procedures. The unit also illustrates the links between these different methods through placing them in the context of the generalised linear model; in so doing the unit enhances students' understanding of statistical methods and their relationship with research design. Practical classes utilise the Stata statistical package.

Important Academic Dates

Information about important academic dates including deadlines for withdrawing from units are available at https://www.mq.edu.au/study/calendar-of-dates

Learning Outcomes

On successful completion of this unit, you will be able to:

ULO1: Clearly and concisely communicate quantitative research results

ULO2: Demonstrate an understanding of the connection between research design and data analytic methods: Apply the appropriate data analytic methods to the respective research designs, and vice versa

ULO3: Communicate an understanding of the complexities of various research designs with respect to their data analysis and interpretation

ULO4: Demonstrate and apply an understanding of the framework of data analysis methods that exist within the Generalized Linear Model

ULO5: Appropriately apply analysis methods to a given research design, type of data and research question

ULO6: Undertake data analysis using Stata that answers practical questions in psychology research

General Assessment Information

Late Penalties

Late submission of the practical project will receive a 5% per day penalty including weekends and public holidays, unless an extension has been granted through special consideration. Since the project is worth 40%, that means 2 marks (5% of 40 marks) will be deducted from the student's final mark per day late submission. No late submissions will be accepted more than 5 days after the submission deadline, unless special consideration has been granted. No further submissions will be accepted after the marked assignments are returned and feedback is released to students.

All requests for special consideration must be formally requested via ask.mq.edu.au in line with the special consideration policy.

Examination Policy

You are expected to present yourself for examination at the time and place designated in the University Examination Timetable. The timetable will be available in Draft form approximately eight weeks before the commencement of the examinations and in Final form approximately four weeks before the commencement of the examinations and will be available from this website: http://students.mq.edu.au/student_admin/exams

The only exception to not sitting an examination at the designated time is because of documented illness or unavoidable disruption. In these circumstances you should apply for Special Consideration, through https://ask.mq.edu.au. If a Supplementary Examination is granted as a result of the Special Consideration process, the examination will be scheduled after the conclusion of the official examination period. An email will be sent to the student advising them of the outcome of their request for a supplementary exam. If a supplementary exam has been granted, it is the student's responsibility to check the date and location of the supplementary exam although they are generally in mid-July. Students who are granted to sit for a supplementary exam must make themselves available to sit for the supplementary exam on the specified date. There will only be one time. You are advised that it is Macquarie University

policy not to set early examinations for individuals or groups of students. All students are expected to ensure that they are available until the end of the teaching semester, which is the final day of the official examination period.

The final exam for this unit is currently scheduled to occur on Macquarie University campus. Students are expected to make themselves available for the final exam, at the date and time set by the University, in line with the Assessment Policy and Procedure. Sitting the final exam is compulsory in order to be eligible to pass the unit. Any student who does not attempt the final exam will be granted a Fail Absent grade.

Weekly online quizzes

12 practical quizzes will be worth 1% each to a maximum overall value of 10% across the session. Only the best 10 quizzes from each student will contribute to the final score out of 10. The two quizzes with the lowest scores across the session will be discounted from each student's mark.

The unit's practical program is vital for students to have a first-hand understanding of the material and its application in psychology research. Each week (starting week 1) there will be a set of practical tasks to complete. Most weeks this will involve a simple, practical data analysis (involving Stata) and interpretation task, although some weeks students may be given Stata output to interpret and asked to answer some questions using the output. The requirement to complete a small online quiz each week will help ensure that students keep up with the unit material week-by-week. Tutors will then work through the solution during practical classes in the subsequent week. Solutions to quizzes will not be made available outside of practical classes. The final task, which students complete in Week 13, will be graded but will not be reviewed in practical classes. The answers will be posted on iLearn instead. Quizzes must be completed within iLearn by 5pm on the Friday before the week in which it will be discussed. The one exception to this rule is the quiz for Week 1 which must be submitted via iLearn by 5pm on Sunday 27th February. The iLearn quiz will not accept submissions after the deadline and a mark of zero for that week will be recorded if no quiz is submitted on-time. Each quiz is completed via iLearn and you will receive your mark once the quiz closes.

The quizzes must be completed *individually* by each student. If there are technical problems associated with iLearn (e.g., error message and then being unable to complete the quiz), make sure you take a screen shot of any error messages that occur. If a screen shot of an error occurring within iLearn is sent to Alissa Beath *before* the quiz deadline, and it is deemed to be an error occurring that was out of the student's control, then a second attempt at the quiz will be granted, as long as the quiz attempt was commenced *at least 2 hours before the quiz deadline* and must be completed before the first practical class that reviews the quiz. No second attempts will be granted if you begin your attempt too late and cannot complete the quiz before 5pm Friday. It is strongly recommended you complete your quiz well in advance of the 5pm deadline! In the event of health or other issues that may prevent you from completing the quiz by the 5pm deadline, you may apply for Special Consideration to be exempted from 1 quiz only. If further issues are experienced that warrant special consideration, an alternate assessment task will be set to replace the missed quiz(zes).

Midsession Practical Exam

PSYU3349 is a unit emphasising practical data analysis for psychologists and hence an assessment on practical data analysis is crucial. This is a one-hour computer-based test conducted on campus, which will cover the content from Weeks 1 – 4 of the unit. The test will involve “live” analysis of datasets in Stata, and students will be required to answer questions relating to their analyses. Questions will be a combination of fill in the blank-style numeric entry questions and multiple choice questions. The test will be conducted entirely through iLearn. No internet access is allowed during this exam and any attempt to do so will be considered cheating. Separate laptops / tablets / mobile phones will not be permitted. The test is closed book and no external written or electronic materials will be permitted. Students are required to enrol in one of the exam "class" slots on eStudent in the same manner as you enrol in other unit classes. Students will only be permitted to sit the test in the slot in which they are enrolled and must bring their student ID to the exam room for verification. If you do not enrol in one of the slots or you do not bring your student ID you will not be eligible to sit the test. Similarly, if you miss your timeslot you will not be permitted to sit the test in the subsequent slot. Students who are offshore will be required to take the exam online under invigilated conditions and must contact Alissa Beath to set this up.

Practical project

In the practical project, students are asked to address a practical research question and must operationalise it and determine an appropriate course of analysis with only general directions. Stata commands needed to complete the practical project will not be provided for you. You will be expected to have learnt the required Stata commands through understanding the demonstration programs used in lectures, quizzes, and practical classes, and through your own practice with Stata. Details of the practical project including the question and the dataset will be made available via iLearn.

Please also note that iLearn can lag when large numbers of students are in the system at the same time. Submission time for assignments will be counted as the time the assessment was received. Because of this, make sure you don't leave your submission minutes before is due! Late penalties will be strictly applied to assignments that are received after the due time.

Assessment Tasks

Name	Weighting	Hurdle	Due
Online quizzes	10%	No	Weekly
Mid session Examination	10%	No	Wednesday 6 April 2022 (Week 7)
Practical Project	40%	No	Week 8
Final Examination	40%	No	Formal University Examination Period

Online quizzes

Assessment Type [1]: Quiz/Test
Indicative Time on Task [2]: 12 hours

Due: **Weekly**
Weighting: **10%**

Regular online quizzes requiring practical data analysis

On successful completion you will be able to:

- Clearly and concisely communicate quantitative research results
- Demonstrate an understanding of the connection between research design and data analytic methods: Apply the appropriate data analytic methods to the respective research designs, and vice versa
- Communicate an understanding of the complexities of various research designs with respect to their data analysis and interpretation
- Demonstrate and apply an understanding of the framework of data analysis methods that exist within the Generalized Linear Model
- Appropriately apply analysis methods to a given research design, type of data and research question
- Undertake data analysis using Stata that answers practical questions in psychology research

Mid session Examination

Assessment Type [1]: Examination
Indicative Time on Task [2]: 10 hours
Due: **Wednesday 6 April 2022 (Week 7)**
Weighting: **10%**

Practical exam requiring data analysis

On successful completion you will be able to:

- Demonstrate an understanding of the connection between research design and data analytic methods: Apply the appropriate data analytic methods to the respective research designs, and vice versa
- Communicate an understanding of the complexities of various research designs with respect to their data analysis and interpretation
- Demonstrate and apply an understanding of the framework of data analysis methods that

exist within the Generalized Linear Model
- Appropriately apply analysis methods to a given research design, type of data and research question
- Undertake data analysis using Stata that answers practical questions in psychology research

Practical Project

Assessment Type [1]: Quantitative analysis task
Indicative Time on Task [2]: 40 hours
Due: **Week 8**
Weighting: **40%**

Practical project requiring data analysis and a written report to address a research question within the context of psychology research

On successful completion you will be able to:
- Clearly and concisely communicate quantitative research results
- Demonstrate an understanding of the connection between research design and data analytic methods: Apply the appropriate data analytic methods to the respective research designs, and vice versa
- Communicate an understanding of the complexities of various research designs with respect to their data analysis and interpretation
- Appropriately apply analysis methods to a given research design, type of data and research question
- Undertake data analysis using Stata that answers practical questions in psychology research

Final Examination

Assessment Type [1]: Examination
Indicative Time on Task [2]: 31 hours
Due: **Formal University Examination Period**
Weighting: **40%**

Final examination held within the University's formal exam period, in accordance with relevant requirements.

On successful completion you will be able to:

- Demonstrate an understanding of the connection between research design and data analytic methods: Apply the appropriate data analytic methods to the respective research designs, and vice versa
- Communicate an understanding of the complexities of various research designs with respect to their data analysis and interpretation
- Demonstrate and apply an understanding of the framework of data analysis methods that exist within the Generalized Linear Model
- Appropriately apply analysis methods to a given research design, type of data and research question
- Undertake data analysis using Stata that answers practical questions in psychology research

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[1] If you need help with your assignment, please contact:

- the academic teaching staff in your unit for guidance in understanding or completing this type of assessment
- the Writing Centre for academic skills support.

[2] Indicative time-on-task is an estimate of the time required for completion of the assessment task and is subject to individual variation

Delivery and Resources

Lectures

There are three hours of lectures per week. These lectures will take place on campus (Fridays 11am - 2pm), and recordings will be available via Echo360 on iLearn after the lecture has concluded.

Practical Classes

There is a one hour practical class each week, starting in Week 2. You must attend the class you are enrolled in. Official changes to all classes can be done online via eStudent. If you cannot attend your scheduled class for a particular week, you may attend an alternate class as a make-up provided: 1) for on-campus classes there are spare seats after all students enrolled in that class have taken their seats and 2) for on-line classes students understand that those enrolled in the class will have priority when asking questions during class. Please email the tutor of the class you wish to attend for a particular week to check.

In Person Scheduled Attendance Pattern: This version of the unit is “In person scheduled weekday”. Students can enroll in either an on-campus lecture (space permitting) or an online/ live-streamed lecture classes. This version of the unit has on-campus practical classes only.

Students should not attend on-campus classes if you are unwell or have any cold and flu-like symptoms. Ensure you follow the most recent University COVID-19 advice https://www.mq.edu.au/about/coronavirus-faqs/information-for-students For general information on unit versions, see this website https://students.mq.edu.au/study/enrolling/choosing-units

In Person / Online Scheduled Attendance Pattern: This version of the unit is "In person / online scheduled weekday". This offering has some online tutorial/practical classes and some on-campus classes, although online options are limited. Online practical class options are intended to be reserved for students with genuine need to study online (for example, those who are studying offshore, or those who have other exceptional circumstances that prevent on-campus attendance for the entire semester). The online tutorials should not be attended by students who simply prefer to study online. Class availability can be seen via eStudent class enrolment: the location of the class indicates if it is an online class or an on-campus class. Note that enrolment in online classes does not mean that the entire unit will be taken online. Certain assessment tasks (for example, final exams) can still be scheduled to have compulsory on-campus attendance.

For general information on unit versions, see this website https://students.mq.edu.au/study/enrolling/choosing-units

Textbook

Agresti, A. (2018). Statistical Methods for the Social Sciences (5thed.). Boston, USA: Pearson.

Additional weekly readings are available through Leganto on iLearn.

Computing

You are expected to have had prior experience in the use of Stata before coming into PSYU3349, and be able to read raw data files, access pre-existing data files and retrieve Stata data files. You are also expected to have some knowledge of syntax in Stata. You can directly download Stata to your own computer from MQ's website https://students.mq.edu.au/support/technology/software/stata following the instructions closely. If you experience technical issues, contact IT Help https://students.mq.edu.au/support/technology/service-desk

Competent use of Stata is required heading into PSYU3349. If you need a refresher on Stata, then this playlist offers a good place to start: https://www.youtube.com/playlist?list=PLN5IskQdgXWnnIVeA_Y0OBGmnw21fvcmU

Unit Schedule

There are three hours of lectures each week. The lectures are considered essential to understanding the unit material so you must access the recordings online. The lecture content will begin by building on PSYU2248 statistical modelling, with special reference to the General Linear Model (GLM). The GLM includes regression models (simple and multiple), the t-test, oneway ANOVA models, factorial ANOVA models (balanced and unbalanced), ANCOVA models and models involving statistical control with mixed measurement independent variables. For these models we will only concern ourselves with models which have one, numeric dependent variable. Following this, we will cover approaches to analysis of non-Normal dependent variables including bootstrapping and Logistic Regression (categorical DV). As our models become more

complex (i.e., have increasing numbers of independent variables), we will discuss the process of model reduction. The unit finishes with an extension of ANOVA content into repeated measures and mixed within/between subject designs.

Week by week list of topics (note: this is subject to change)				
Week	Lecture Topic	Reading	Assessment	Prac Class Topic
1	Administration, Overview of the unit Multiple regression	Textbook Ch 9 (revision) Textbook Ch 11 (new)	Quiz - revision	*No prac classes*
2	ANOVA by regression I	Textbook 12.1 – 12.4	Quiz – simple regression	Revision
3	ANOVA by regression II	Textbook 12.1 – 12.4	Quiz – multiple regression	Simple regression
4	ANCOVA	Textbook 13.1 – 13.2	Quiz – ANOVA via regression	Multiple regression
5	Curvilinear relationships	Textbook 14.5	Quiz – ANCOVA	ANOVA via regression
6	Badly behaved data	Textbook 5.5, 14.2	Quiz - Curvilinear	ANCOVA
7	Model reduction	Textbook 14.1 Supplementary notes	Mid-session exam Quiz – badly behaved data	Curvilinear
Mid-session break				
8	Categorical data and logistic regression I	Textbook 8.1 – 8.2, 15.1	Prac project due (no quiz)	Badly behaved data
9	Logistic regression II	Textbook 15.1 – 15.3	Quiz – model reduction	*No prac classes*
10	Paired t-test and repeated measures	Howell 7.4	Quiz – logistic regression	Model reduction
11	Repeated measures I	Howell 14.1 – 14.5	Quiz – paired t-tests and one-way RM ANOVA	Logistic regression
12	Repeated measures II + Mixed designs	Howell 14.7	Quiz – two-way RM ANOVA	Paired t-tests and one-way RM ANOVA
13	End-of-session Recap		Quiz – Mixed designs	Two-way RM ANOVA

Policies and Procedures

Macquarie University policies and procedures are accessible from Policy Central (https://policies.mq.edu.au). Students should be aware of the following policies in particular with regard to Learning and Teaching:

- Academic Appeals Policy
- Academic Integrity Policy
- Academic Progression Policy
- Assessment Policy
- Fitness to Practice Procedure
- Assessment Procedure
- Complaints Resolution Procedure for Students and Members of the Public
- Special Consideration Policy

Students seeking more policy resources can visit Student Policies (https://students.mq.edu.au/support/study/policies). It is your one-stop-shop for the key policies you need to know about throughout your undergraduate student journey.

To find other policies relating to Teaching and Learning, visit Policy Central (https://policies.mq.edu.au) and use the search tool.

Student Code of Conduct

Macquarie University students have a responsibility to be familiar with the Student Code of Conduct: https://students.mq.edu.au/admin/other-resources/student-conduct

Results

Results published on platform other than eStudent, (eg. iLearn, Coursera etc.) or released directly by your Unit Convenor, are not confirmed as they are subject to final approval by the University. Once approved, final results will be sent to your student email address and will be made available in eStudent. For more information visit ask.mq.edu.au or if you are a Global MBA student contact globalmba.support@mq.edu.au

Academic Integrity

At Macquarie, we believe academic integrity – honesty, respect, trust, responsibility, fairness and courage – is at the core of learning, teaching and research. We recognise that meeting the expectations required to complete your assessments can be challenging. So, we offer you a range of resources and services to help you reach your potential, including free online writing and maths support, academic skills development and wellbeing consultations.

Grading

Macquarie University follow standards-based assessment of student performance. All individual assessment tasks are subject to moderation, consistent with the Assessment Policy and Procedure. A student's final mark for this unit, and associated grade, must reflect their attainment

of the unit learning outcomes, and isn't necessarily a simple summation of their individual assessment items.

Student Support

Macquarie University provides a range of support services for students. For details, visit http://students.mq.edu.au/support/

The Writing Centre

The Writing Centre provides resources to develop your English language proficiency, academic writing, and communication skills.

- Workshops
- Chat with a WriteWISE peer writing leader
- Access StudyWISE
- Upload an assignment to Studiosity
- Complete the Academic Integrity Module

The Library provides online and face to face support to help you find and use relevant information resources.

- Subject and Research Guides
- Ask a Librarian

Student Services and Support

Macquarie University offers a range of Student Support Services including:

- IT Support
- Accessibility and disability support with study
- Mental health support
- Safety support to respond to bullying, harassment, sexual harassment and sexual assault
- Social support including information about finances, tenancy and legal issues

Student Enquiries

Got a question? Ask us via AskMQ, or contact Service Connect.

IT Help

For help with University computer systems and technology, visit http://www.mq.edu.au/about_us/offices_and_units/information_technology/help/.

When using the University's IT, you must adhere to the Acceptable Use of IT Resources Policy. The policy applies to all who connect to the MQ network including students.

Changes since First Published

Date	Description
24/02/2022	Adding Erik Reichle as co-convener