

University of Waterloo
Department of Psychology
Psych 390
Natural Science Advanced Research Methods Topics: Research in Cognition
Spring 2023
MW 10:00-11:20 PAS 1237

Instructor and T.A. Information

Instructor: Evan F. Risko

Office: PAS 4010

Office Phone: Not applicable

Office Hours: Students will have regularly scheduled meetings with the instructor. Otherwise, by appointment.

Email: efrisko@uwaterloo.ca

Please contact the instructor and TA using the email address provided. If we need to contact you, then we will do so using your official uWaterloo address. Students are responsible for all e-mail that is sent to the official uWaterloo email address. Check e-mail regularly for important and time sensitive messages.

See statement on official student e-mail address for further details e.g., procedures and warnings regarding forwarding e-mail to other accounts

T.A.	Laura Bianchi
Email	ljbianchi@uwaterloo.ca
Office	4268
Office Hours	By appointment

Course Description

The goal of the course is to introduce students to research in cognitive psychology

Course Objectives

Goals and learning outcomes are based on APA guidelines for Undergraduate Psychology Majors. Upon completion of this course, students should be able to:

- Demonstrate a working knowledge of research in cognitive psychology
- Use scientific reasoning to interpret psychological phenomena
- Demonstrate psychology information literacy
- Engage in innovative and integrative thinking and problem solving
- Interpret, design, and conduct basic psychological research
- Demonstrate effective writing
- Exhibit effective presentation skills
- Refine project-management skills

Required Text

- There is no textbook for this course

Readings Available on LEARN

- Readings for the course will consist of primary source material (i.e., journal articles). While the number of pages of text required each week may not be high, reading primary source material is typically much more challenging than textbooks so you should be prepared to read papers more than once. All readings are available on LEARN or through the University of Waterloo Library.

Course Requirements and Assessment

Assessment	Date of Evaluation (if known)	Weighting
Lab Assignments	see course outline	30%
Poster Presentation	June 2 nd [presentation date will be either June 5 th or 7 th]	10%
Participation & Research Experience	Before last day of classes	10%
Research Proposal	June 30th	30%
Research Report	July 31st	20%
Total		100%

Lab Assignments (30%)

There will be 5 lab assignments that will provide students the opportunity to develop and practice fundamental research skills. These assignments are self-guided in that each has an associated document that can be completed independently in lab. When you encounter a problem for which the solution is not immediately apparent, please first attempt to work through the problem to the best of your ability. Following that, consult permitted external resources (e.g., looking online for a tutorial explaining how to conduct a paired t-test in SPSS). Each assignment will outline how external resources can be used, if at all. Whenever you use an external resource you must use proper attribution. Using external resources without proper attribution is an academic offence. If neither of those two solutions work, then ask the TA or Instructor in class (or via email) and they will try to help. Each assignment is worth 6% of your total grade on this component (see course outline for Lab Assignment due dates).

Participation and Research Experience (10%)

Your participation mark will be determined by your participation in the instructor meetings, attending classmate's poster presentations, participating in credit/no credit skill assessments, and class attendance (7%) and completion of the research experience component (3%).

Instructor Meetings. You will have bi-weekly scheduled 15-25 minute one-on-one meetings with the instructor. In this meeting you will have the opportunity to ask questions, discuss the course (e.g., readings, assignments), and receive feedback. These meetings will be scheduled during the first week and occur at the same time each week. Meetings will start Week 2. If you or the instructor need to miss a meeting, then the meeting can occur via email or be rescheduled at a mutually agreeable time. In some class periods there may be opportunities to hold our one-on-one meetings.

Credit/no credit skill assessments. At various points throughout the course we will have in-class skill assessments. Credit will be granted for completion of the skill assessment in class. The purpose of this course component is for you to practice the skills being developed and for us to be able to assess skill development in the course.

Research Experience (3%). You will complete 4 research participation credits or 4 article reviews. Please see RESEARCH_PARTICIPATION_INFORMATION on Learn for more information. The research experience needs to be completed before the last day of classes.

Poster Presentations (10%)

The poster presentation component of the course will consist of the presentation of a research paper in the form of a poster. Poster presentations constitute an important avenue for the communication of research. The paper you present will be chosen during lab Assignment #1. You will be marked both on the content and your presentation. If you are not presenting, then you are expected to attend the poster session and to visit your classmates' posters (this will be part of your participation grade). Your presentation date will be assigned to you. Further information about how to prepare a poster will be provided in class. Please submit the poster to the electronic dropbox on LEARN on or before midnight on the due date. You cannot use external resources (e.g., artificial intelligence, Internet) to create poster content or your script for the presentation. You can use software to support the creation of the poster (e.g., Powerpoint). If you have questions about the acceptability of using external resources for the Poster Presentation, then please ask the instructor.

Research Proposal (30%)

The goal of this assignment is for you to write a research proposal. The lab assignments will focus on skill development relevant to this goal. You will propose a novel behavioural experiment to test a proposed explanation of a cognitive phenomenon/effect. Please mind the dictum "Keep it simple." This should be a behavioural experiment, using a ready at hand sample, with a straightforward design, and requiring straightforward statistical tests within your skillset. Proposing tractable studies is an important and overlooked skill. Note that you will be expected in the Research Report to program the experiment and analyze the data that your proposed experiment would generate. You cannot use external sources (e.g., artificial intelligence, Internet) to write the Research Proposal, generate and/or design the proposed experiment, or generate the prediction. You can use external resources (e.g., artificial intelligence, Internet) for non-writing related support as long as you properly cite the resource used. For example, you need to conduct a power analysis to justify your proposed sample size. Using software (e.g., G*Power) to do such a power analysis would be acceptable as long as you properly cite its use (e.g., "A power analysis was conducted using G*Power (Faul et al., 2007)..."). Using external resources without proper attribution is an academic offence. If you have questions about the acceptability of using external resources (e.g., artificial intelligence, Internet) for the Research Proposal, then please ask the instructor.

Your written research proposal should include:

- (a) an Introduction consisting of a brief review of the relevant literature and a clear motivation for your proposed experiment (see Assignment #1). Please cite at least 6 articles.
- (b) a clear description of the phenomenon/effect that you are examining, the explanation you are testing and the prediction to be tested including a clear IF...THEN statement (see Assignment #2). You do not need to generate the explanation yourself (but you can if you like). In many cases, we are testing the proposed explanations of other researchers. This is perfectly fine. As such, you can use external resources to identify a proposed explanation as long as they are properly cited.
- (c) the proposed methods including the number of participants with associated justification for the sample size (using a power analysis), the design, the stimuli to be used (include exact stimuli or

examples in an appendix), and a description of the procedure including a figure that visually communicates it (see Assignment #3).

(d) a description of the statistical tests to be used to test your explanation

(e) a complete AsPredicted.org style pre-registration (see Assignment #3) for your proposed experiment (does not count towards the maximum number of pages). A word document with the required questions will be provided on Learn (i.e., you do not need to complete the pre-registration on OSF.io or AsPredicted.org).

Technical Requirements

The paper must be at least 5 pages and no longer than 6 pages

Include a title page, abstract, and references. These components do not count against the minimum or maximum length requirements

You must use 12 point Times New Roman font, double spaced, 2.5 cm margins

Use APA style. Submit as a Microsoft Word document.

Please submit to the electronic dropbox on LEARN on or before midnight on the due date.

You are responsible for keeping a copy of the final version of your Research Proposal.

Research Report (20%)

The goal of this assignment is for you to write a complete research report in the format of a published APA article. The in-class assignments will focus on skill development relevant to this goal. The Research Report will build on your Research Proposal. That is, you will receive feedback on your Research Proposal to be integrated. In addition, you will program the experimental task you proposed and you will be provided with a simulated dataset based on your proposed study that you will need to analyze. You will report the results, interpret them within the context of your proposed explanation and prediction, and complete a General Discussion. You cannot use external sources (e.g., artificial intelligence, Internet) to write the Research Report, program the experiment, or interpret the results. You can use external resources (e.g., artificial intelligence, Internet) for non-writing related support as long as you properly cite the resource used. For example, you will need to analyze the data. Using software (e.g., SPSS, R) to do such an analysis would be acceptable as long as you properly cite its use (e.g., "Analyses were conducted using SPSS 13.0"). Using external resources without proper attribution is an academic offence. If you have questions about the acceptability of using external resources (e.g., artificial intelligence, Internet) for the Research Report, then please ask the instructor.

Your Research Report should include:

(a) a revised Introduction (including the brief review and motivation for your study) and Method section based on feedback from the TA and/or Instructor. In addition, the Introduction and Methods section should now be written from the perspective that the research has been conducted and this is the Research Report.

(b) a working program to administer the proposed task (Assignment #4)

(c) a results section describing the outcome of your planned analyzes using a dataset provided by the instructor and any exploratory analyses that you conducted. In addition, please be sure to conduct a detailed initial data analysis and report any data quality issues (e.g., outliers removed; Assignment #5).

(d) at least one Figure or Table (Assignment #5)

(e) a General Discussion summarizing and interpreting your results (e.g., were your results consistent or

not with the proposed explanation?), integrating those results into the literature, and articulating any limitations and future directions.

Technical Requirements

The Research Report must be at least 8 pages and no longer than 10 pages

Include a title page, abstract, and references. These components do not count against the minimum or maximum length requirements

You must use 12 point Times New Roman font, double spaced, 2.5 cm margins

Use APA style. Submit as a Microsoft Word document.

Please submit to the electronic dropbox on LEARN on or before midnight on the due date.

You are responsible for keeping a copy of the final version of your Research Report.

COVID-19

Students should not come to class or other in-person activities if they are experiencing COVID-19 symptoms or are required to self-isolate. In the event of absence due to influenza-like illness or required self-isolation, students shall submit an Illness Self-declaration. Students can find the Illness Self-declaration form in the Personal Information section of Quest.

Remote Delivery

If the course is moved to remote delivery, there will be no change in the course components or structure of the course (e.g., due dates). All course components (e.g., Lab Assignments, Article Reports) can be completed remotely. The software required to complete assignments is free to download or can be accessed via remote desktop through the university. One-on-one meetings with the instructor or TA and poster presentations will occur on Teams. A synchronous meeting will be available during class time and any lecture material will be recorded and posted.

Course Outline

Week	Date	Tasks	Readings Due
All Weeks	All	You should be working on the Research Proposal and Research Report each week. The Assignments will help you stay on track to some extent (i.e., parts of the Assignments will be used in your Research Proposal and Research Report), but the Research Proposal and Research Report are composed of multiple components and represent a significant time commitment. Please try to distribute that time wisely.	
1	May 8 & 10	(1) Attend class (2) Review syllabus (3) Schedule an instructor meeting	Wright & Klumpp (2004) Kroneisen et al. (2021)

Week	Date	Tasks	Readings Due
		time (4) Work on Assignment #1 (5) Read the required papers	
2	May 15 & 17	(1) Attend class (2) Read the required papers (3) Work on Assignment #1 (4) Instructor meeting (if you are scheduled for this week) (5) Submit Assignment #1 by Friday May 19th at midnight.	Lombrozo & Liquin (2023) Melby-Lervåg, et al. (2016)
3	May 23 & 24	(1) Attend class (2) Read the required papers (3) Work on Assignment #2 (4) Instructor meeting (if you are scheduled for this week)	Glanzer & Cunitz (1966) Roediger & Karpicke (2006)
4	May 29 & 31	(1) Attend class (2) Work on poster presentation (3) Work on Assignment #2 (4) Read the student choice papers (5) Instructor meeting (if you are scheduled for this week) (6) Submit poster and Assignment #2 by Friday June 2nd at midnight	Student's Choice #1 Student's Choice #2
5	June 5 & 7	(1) Attend in-class poster presentations (2) Work on Assignment #3 (3) Read the student choice papers (4) Instructor meeting (if you are scheduled for this week)	Student's Choice #3 Student's Choice #4
6	June 12 & 14	(1) Attend class (2) Work on Assignment #3 (3) Read the student choice papers (4) Instructor meeting (if you are scheduled for this week)	Student's Choice #5 Student's Choice #6
7	June 19 & 21	(1) Attend class (2) Work on Assignment #3 and/or #4 (3) Read the required paper (4) Instructor meeting (if you are scheduled for this week)	Marsh et al. (2016)

Week	Date	Tasks	Readings Due
		(5) Submit Assignment #3 by Friday June 23rd at midnight	
8	June 26 & 28	(1) Attend class (2) Work on Assignment #4 (3) Read the required paper (4) Instructor meeting (if you are scheduled for this week) (5) Submit Research Proposal by Friday June 30th at midnight	Spalek & Hammond (2005)
9	July 5	(1) Attend class (2) Work on Assignment #4 and/or #5 (3) Instructor meeting (if you are scheduled for this week) (4) Submit Assignment #4 by Friday July 7th at midnight	No Readings
10	July 10 & 12	(1) Attend class (2) Work on Assignment #5 (3) Read the required paper (4) Instructor meeting (if you are scheduled for this week)	MacLeod et al. (2010)
11	July 17 & 19	(1) Attend class (2) Work on Assignment #5 (3) Read the required paper (4) Instructor meeting (if you are scheduled for this week) (5) Submit Assignment #5 by Friday July 21st at midnight for early feedback	Ovalle-Fresa et al. (2021)
12	July 24 & 26	(1) Attend class (2) Work on Assignment #5 (3) Submit Assignment #5 by Friday July 28th at midnight (4) Work on Research Report	No readings
13	July 31	(1) Attend class (2) Work on Research Report (3) Submit Research Report by Monday July 31st at midnight	No readings

Late Work

A late penalty of 10% per day late (24 hours) will be levied against late Lab Assignments, Poster submission, and the Research Proposal. A missed poster presentation cannot be made up. No course component can be submitted after August 4th, 2023. The Research Experience component cannot be submitted after the deadline.

Electronic Device Policy

None.

Information on Plagiarism Detection

None.

Attendance Policy

Students should attend class in-person each week. In addition, you are expected to meet with the instructor bi-weekly. If you are unavailable to meet, then please let the instructor know so that the meeting can be rescheduled or other accommodations agreed upon.

Academic Integrity

In order to maintain a culture of academic integrity, members of the University of Waterloo community are expected to promote honesty, trust, fairness, respect and responsibility. [Check [the Office of Academic Integrity](#) for more information.]

The use of artificial intelligence (e.g., chatGPT) is not permitted in this course unless the instructor indicates otherwise (e.g., in an assignment). When permitted, use of any external resource (e.g., artificial intelligence, software, Internet) should be cited appropriately. A student who is unsure whether external resource use constitutes an offence, or who needs help in learning how to avoid offences (e.g., plagiarism, cheating) should seek guidance from the course instructor or TA.

Discipline

A student is expected to know what constitutes academic integrity to avoid committing an academic offence, and to take responsibility for their actions. [Check [the Office of Academic Integrity](#) for more information.] A student who is unsure whether an action constitutes an offence, or who needs help in learning how to avoid offences (e.g., plagiarism, cheating) or about “rules” for group work/collaboration should seek guidance from the course instructor, academic advisor, or the undergraduate associate dean. For information on categories of offences and types of penalties, students should refer to [Policy 71, Student Discipline](#). For typical penalties, check [Guidelines for the Assessment of Penalties](#).

Concerns about a Course Policy or Decision

Informal Stage. We in the Psychology Department take great pride in the high quality of our program and our instructors. Though infrequent, we know that students occasionally find themselves in situations of conflict with their instructors over course policies or grade assessments. If such a conflict arises, the Associate Chair for Undergraduate Affairs (Stephanie Denison) is available for consultation and to mediate a resolution between the student and instructor: Email: stephanie.denison@uwaterloo.ca.

Grievance

A student who believes that a decision affecting some aspect of their university life has been unfair or unreasonable may have grounds for initiating a grievance. Read [Policy 70, Student Petitions and Grievances, Section 4](#). When in doubt, please be certain to contact the department's administrative assistant who will provide further assistance.

Appeals

A decision made or penalty imposed under [Policy 70, Student Petitions and Grievances](#) (other than a petition) or [Policy 71, Student Discipline](#) may be appealed if there is a ground. A student who believes they have a ground for an appeal should refer to [Policy 72, Student Appeals](#).

Note for Students with Disabilities

[AccessAbility Services](#), located in Needles Hall, Room 1401, collaborates with all academic departments to arrange appropriate accommodations for students with disabilities without compromising the academic integrity of the curriculum. If you require academic accommodations to lessen the impact of your disability, please register with AccessAbility Services at the beginning of each academic term.

Cross-listed Course (if applicable)

Please note that a cross-listed course will count in all respective averages no matter under which rubric it has been taken. For example, a PHIL/PSCI cross-list will count in a Philosophy major average, even if the course was taken under the Political Science rubric.

Accommodation for course requirements for Psychology courses.

Policies of the Psychology department pertaining to course requirements are available on the [department website](#).

Chosen/Preferred First Name

Do you want professors and interviewers to call you by a different first name? Take a minute now to verify or tell us your chosen/preferred first name by logging into [WatIAM](#).

Why? Starting in winter 2020, your chosen/preferred first name listed in WatIAM will be used broadly across campus (e.g., LEARN, Quest, WaterlooWorks, WatCard, etc). Note: Your legal first name will always be used on certain official documents. For more details, visit [Updating Personal Information](#).

Important notes

- If you included a preferred name on your OUAC application, it will be used as your chosen/preferred name unless you make a change now.
- If you don't provide a chosen/preferred name, your legal first name will continue to be used.

Mental Health Support

All of us need a support system. The faculty and staff in Arts encourage students to seek out mental health support if they are needed.

On Campus

Due to COVID-19 and campus closures, services are available only online or by phone.

- Counselling Services: counselling.services@uwaterloo.ca / 519-888-4567 ext. 32655
- **MATES**: one-to-one peer support program offered by the Waterloo Undergraduate Student Association (WUSA) and Counselling Services

Off campus, 24/7

- **Good2Talk**: Free confidential help line for post-secondary students. Phone: 1-866-925-5454
- Grand River Hospital: Emergency care for mental health crisis. Phone: 519-749-4300 ext. 6880
- **Here 24/7**: Mental Health and Crisis Service Team. Phone: 1-844-437-3247
- **OK2BME**: set of support services for lesbian, gay, bisexual, transgender or questioning teens in Waterloo. Phone: 519-884-0000 extension 213

Full details can be found online on the Faculty of Arts [website](#)

Download [UWaterloo and regional mental health resources \(PDF\)](#)

Download the [WatSafe app](#) to your phone to quickly access mental health support information.

Territorial Acknowledgement

We acknowledge that we are living and working on the traditional territory of the Attawandaron (also known as Neutral), Anishinaabe and Haudenosaunee peoples. The University of Waterloo is situated on the Haldimand Tract, the land promised to the Six Nations that includes ten kilometres on each side of the Grand River.

For more information about the purpose of territorial acknowledgements, please see the [CAUT Guide to Acknowledging Traditional Territory](#).

Academic freedom at the University of Waterloo

[Policy 33, Ethical Behaviour](#) states, as one of its general principles (Section 1), “The University supports academic freedom for all members of the University community. Academic freedom carries with it the duty to use that freedom in a manner consistent with the scholarly obligation to base teaching and research on an honest and ethical quest for knowledge. In the context of this policy, 'academic freedom' refers to academic activities, including teaching and scholarship, as is articulated in the principles set out in the Memorandum of Agreement between the FAUW and the University of Waterloo, 1998 (Article 6). The academic environment which fosters free debate may from time to time include the presentation or discussion of unpopular opinions or controversial material. Such material shall be dealt with as openly, respectfully and sensitively as possible.” This definition is repeated in Policies 70 and 71, and in the Memorandum of Agreement, Section 6

Intellectual Property

Students should be aware that this course contains the intellectual property of their instructor, TA, and/or the University of Waterloo.

Intellectual property includes items such as:

- Lecture content, spoken and written (and any audio/video recording thereof);
- Lecture handouts, presentations, and other materials prepared for the course (e.g., PowerPoint slides);

- Questions or solution sets from various types of assessments (e.g., assignments, quizzes, tests, final exams); and
- Work protected by copyright (e.g., any work authored by the instructor or TA or used by the instructor or TA with permission of the copyright owner).

Course materials and the intellectual property contained therein, are used to enhance a student's educational experience. However, sharing this intellectual property without the intellectual property owner's permission is a violation of intellectual property rights. For this reason, it is necessary to ask the instructor, TA and/or the University of Waterloo for permission before uploading and sharing the intellectual property of others online (e.g., to an online repository).

Permission from an instructor, TA or the University is also necessary before sharing the intellectual property of others from completed courses with students taking the same/similar courses in subsequent terms/years. In many cases, instructors might be happy to allow distribution of certain materials. However, doing so without expressed permission is considered a violation of intellectual property rights.

Please alert the instructor if you become aware of intellectual property belonging to others (past or present) circulating, either through the student body or online. The intellectual property rights owner deserves to know (and may have already given their consent).