

**Psychology 221 – Fall 2020**  
**Research Design and Analysis in Psychology**

Instructors

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Office hours: Wed 10 – 11:30 (via Zoom)  
Thurs 2 – 3:30 (via Zoom)  
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Mon 11 – noon (via Zoom)  
Thurs 1 – 3 (via Zoom)  
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**OBJECTIVES**

This course will cover basic principles of research design, measurement, and inference in psychological research. By reading several primary research articles and applying principles you have learned, the course ought to improve your ability to evaluate psychological research critically. By writing an original research report, the course ought to improve your ability to formulate and justify testable hypotheses, to describe the sampling and analysis procedures you have used, to report research results, and to draw intelligent conclusions from your own research.

In this course, we will teach you how to use quantitative and graphical methods to represent descriptive statistics. In addition, you will learn about inferential statistics commonly used in psychological research, including hypothesis testing with confidence intervals,  $z$ - and  $t$ -statistics, 1- and 2-factor analysis of variance with multiple group comparisons, correlation, and contingency table analysis. The emphasis of the course will be on applied data analysis. Although you will perform some statistical calculations by hand, the labs will focus on learning how to use a computer application, Statistical Package for the Social Sciences (SPSS). This course assumes mathematics proficiency equivalent to two years of high school algebra, but not calculus or matrix algebra.

Texts (abbreviations used in the schedule of readings are shown in brackets)

Morling, B. (2018). *Research Methods in Psychology* (3rd ed.). New York: W. W. Norton. ISBN 978-0-393617542 [M]

Welkowitz, J., Cohen, B. H., & Lea, R. B. (2012). *Introductory Statistics for the Behavioral Sciences* (7th ed.). Hoboken, NJ: John Wiley & Sons. ISBN 978-0-470-90776-4 [WCL]

American Psychological Association. (2020). *Publication Manual of the American Psychological Association* (7th ed.). Washington, D.C.: Author. ISBN 978-1-4338-3216-1 [APA]

The following readings will be available on Moodle at <https://moodle.trincoll.edu/login>. Please print only one copy of each reading (copyright law: 1 printed copy per student).

### Class readings

- Glass, G. V., & Hopkins, K. D. (1996). *Statistical Methods in Education and Psychology (3rd ed.)*. Boston: Allyn and Bacon. Selection from Chapter 3. [GH]
- Overmier, J. B., & Seligman, M. E. P. (1967). Effects of inescapable shock upon subsequent escape and avoidance responding. *Journal of Comparative and Physiological Psychology*, *63*, 28-33. doi 10.1037/h0024166 [CR1]
- Milgram, S. (1965/1972). Some conditions of obedience and disobedience to authority. In Arthur G. Miller (Ed.), *The Social Psychology of Psychological Research* (pp. 82-105). New York: Free Press. [CR2a]
- Burger, J. M. (2009). Replicating Milgram: Would people still obey today? *American Psychologist*, *64*, 1-11. doi 10.1037/a0010932 [CR2b]
- Saxe, L., Dougherty, D., & Cross, T. (1985). The validity of polygraph testing: Scientific analysis and public controversy. *American Psychologist*, *40*, 355-366. doi 10.1037/0003-066X.40.3.355 [CR3]

The following lab readings will be available on the Moodle site for RDA lab. Please print only one copy of each reading (copyright law: 1 printed copy per student).

### Lab readings

- Field, A. (2014). The IBM SPSS statistics environment. In *Discovering statistics using SPSS (4th ed.)* (pp. 89-120). Sage.
- Kramer, A. D. I., Guillory, J. E., & Hancock, J. T. (2014). Experimental evidence of massive-scale emotional contagion through social networks. *Proceedings of the National Academy of Sciences of the United States of America*, *111*(24), 8788-8790, doi:10.1073/pnas.1320040111
- Laubepin, F. (2013). *How to read (and understand) a social science journal article*. Retrieved from [http://www.icpsr.umich.edu/files/instructors/How\\_to\\_Read\\_a\\_Journal\\_Article.pdf](http://www.icpsr.umich.edu/files/instructors/How_to_Read_a_Journal_Article.pdf)
- Levy, D. A. (1997). Correlation does not prove causation: Confusing "what" with "why." In *Tools of critical thinking: Metathoughts for psychology* (pp. 59-63). Waveland Press.
- Nicol, A. A. M., & Pexman, P. M. (2010). Visuals for presentations. In *Displaying your findings* (pp. 177-184). American Psychological Association.
- Pallant, J. (2005). Manipulating the data. In *The SPSS survival manual (2nd ed.)* (pp. 78-81). Allen and Unwin.
- Pallant, J. (2005). Preparing a codebook. In *The SPSS survival manual (2nd ed.)* (pp. 12-15). Allen and Unwin.
- Pallant, J. (2005). Two-way between-groups ANOVA. In *The SPSS survival manual (2nd ed.)* (pp. 229-238). Allen and Unwin.

Thaiss, C., & Sanford, J. F. (2000). *Writing for psychology (Excerpts: Writing in Psychology, Introduction)*. Allyn & Bacon.

Writing Tutorial Services, Indiana University. (2004). *Plagiarism: What it is and how to recognize and avoid it*. Retrieved from <http://www.indiana.edu/wts/pamphlets/plagiarism.shtml>

### SCHEDULE

Class will meet on Monday, Wednesday, and Friday from 8:55 to 9:45 am Eastern Standard Time. Lab sessions will meet from 2:00 to 4:40 pm on Mondays and Tuesdays. All class and lab sessions will be held synchronously, on-line via Zoom.

<u>Date</u>	<u>Topic</u>	<u>Assignment</u>
Mon, 9/7	Course overview	{none}
Mon, 9/7 Tues, 9/8	Lab 1-Introduction to lab and data analysis project (DAP)	{none}
<u>Descriptive Statistics</u>		
Wed, 9/9	Introduction to descriptive statistics; frequency distributions and graphs	Read WCL, Ch 1 (pp. 3-12, 16-19); Ch 2 (pp. 26-31, 39-47)
Fri, 9/11	Visual displays of quantitative information	Read GH, Ch 3 (pp. 31-41)
Mon, 9/14	Measures of central tendency; percentiles	Read WCL, Ch 2 (pp. 50-52); Ch 3 (pp. 53-61)
Mon, 9/14 Tues, 9/15	Lab 2-Introduction to SPSS; Operational definitions for DAP	See lab syllabus
Wed, 9/16	Measures of variability and outliers	Read WCL, Ch 3 (pp. 62-75); <b>Problem Set 1 due</b>
Fri, 9/18	Standardized scores and the normal distribution	Read WCL, Ch 4; <b>Problem Set 2 due</b>
<u>Inferential Statistics</u>		
Mon, 9/21	Introduction to statistical inference	Read WCL, Ch 5 (pp. 111-122)
Mon, 9/21 Tues, 9/22	Lab 3-Online searches; Scientific Writing	See lab syllabus
Wed, 9/23	Introduction to statistical inference (continued)	Read WCL, Ch 5 (pp. 122-135); <b>Problem Set 3 due</b>
Fri, 9/25	<b>Test 1</b>	
Mon, 9/28	The one-sample <i>t</i> test and interval estimation	Read WCL, Ch 6 (pp. 142-148)

<u>Date</u>	<u>Topic</u>	<u>Assignment</u>
<u>Inferential Statistics</u> (continued)		
Mon, 9/28 Tues, 9/29	Lab 4-Scientific writing (continued); Hypotheses; APA Style/Plagiarism	See lab syllabus
Wed, 9/30	The one-sample <i>t</i> test and interval estimation (continued)	Read WCL, Ch 6 (pp. 148-152, 155-156)
Fri, 10/2	Testing hypotheses about the difference between the means of two populations	Read WCL, Ch 7 (pp. 160-170); <b>Problem Set 4 due</b>
Mon, 10/5	Testing hypotheses about the difference between the means of two populations (continued)	Read WCL, Ch 7 (pp. 172-178)
Mon, 10/5 Tues, 10/6	Lab 5-SPSS descriptive stats; Tables and graphs; APA Style	See lab syllabus
Wed, 10/7	Testing hypotheses about the difference between the means of two populations (continued)	Read WCL, Ch 7 (pp. 178-187)
Fri, 10/9	<b>Test 2</b>	
Mon, 10/12	Introduction to power analysis	Read WCL, Ch 11
Mon, 10/12 Tues, 10/13	Lab 6-SPSS: <i>t</i> tests	See lab syllabus
Wed, 10/14	One-way analysis of variance	Read WCL, Ch 12 (pp. 315-331); <b>Problem Set 5 due</b>
Fri, 10/16	One-way analysis of variance (continued)	Read WCL, Ch 12 (pp. 331-342)
Mon, 10/19	One-way analysis of variance (continued)	
Mon, 10/19 Tues, 10/20	Lab 7-SPSS: One-way ANOVA; Two-Factor ANOVA (terms): IV, DV, Levels	See lab syllabus
Wed, 10/21	Multiple group comparisons	Read WCL, Ch 13 (pp. 349-360); <b>Problem Set 6 due</b>
Fri, 10/23	<b>Test 3</b>	
Mon, 10/26	Multiple group comparisons (continued)	Read WCL, Ch 13 (pp. 360-368)
Mon, 10/26 Tues, 10/27	Lab 8- SPSS: Two-Factor ANOVA	See lab syllabus
Wed, 10/28	Two-way analysis of variance	Read WCL, Ch 14 (pp. 372-384); <b>Problem Set 7 due</b>

<u>Date</u>	<u>Topic</u>	<u>Assignment</u>
<u>Inferential Statistics (continued)</u>		
Fri, 10/30	Two-way analysis of variance (continued)	Read WCL, Ch 14 (pp. 384-395)
Mon, 11/2	Linear correlation	Read WCL, Ch 9 (pp. 218-229)
Mon, 11/2 Tues, 11/3	Lab 9-SPSS: Correlations; Discussion	See lab syllabus
Wed, 11/4	Linear correlation (continued)	Read WCL, Ch 9 (pp. 229-238, 242-43); <b>Problem Set 8 due</b>
Fri, 11/6	<b>Test 4</b>	
Mon, 11/9	Inferences about proportions	Read WCL, Ch 17 (pp. 457-464)
Mon, 11/9 Tues, 11/10	Lab 10- PPT techniques; Ethics; Choosing the Best Test	See lab syllabus
Wed, 11/11	Inferences about proportions (continued)	Read WCL, Ch 17 (pp. 464-474); <b>Problem Set 9 due</b>
<u>Design and Interpretation of Psychological Research</u>		
Fri, 11/13	Reasoning in psychological research	Read M, Chs 1 and 3; <b>Problem Set 10 due</b>
Mon, 11/16	Reasoning in psychological research (continued)	Read CR1
Mon, 11/16 Tues, 11/17	Lab 11-Practice oral presentations; Questions about DAP	See lab syllabus
Wed, 11/18	Ethical issues in psychological research	Read M, Ch 4; CR2a or CR2b
Fri, 11/20	<b>Test 5</b>	
Mon, 11/23 – Fri, 11/27	<i>Thanksgiving Vacation</i>	
Mon, 11/30	Quality of measurement	Read M, Ch 5; CR3
Mon, 11/30 Tues, 12/1	Lab 12- Putting It All Together	See lab syllabus
Wed, 12/2	Experiments with independent groups	Read M, Ch 10 (pp. 273-90); <b>Problem Set 11 due</b>
Fri, 12/4	Repeated-measures designs	Read M, Ch 10 (pp. 290-308); <b>Problem Set 12 due;</b> <b>Problem Set 13 (not collected)</b>
Mon, 12/7	Sampling designs for correlational research	Read M, Ch 7

<u>Date</u>	<u>Topic</u>	<u>Assignment</u>
<u>Design and Interpretation of Psychological Research</u> (continued)		
Mon, 12/7 Tues, 12/8	Lab 13-Oral presentations	See lab syllabus
Wed, 12/9	Quasi-experimentation	Read M, Ch 13 (pp. 389-406) ; <b>Problem Sets 14 and 15 (not collected)</b>
Fri, 12/11	<b>Test 6</b>	
Thurs, 12/17 12 – 3 pm	<b>Test 7</b>	

## GRADING and COURSE POLICIES

Your grade in the course will be determined by a combination of: Tests (60% overall), Class homework problems (10%), Lab attendance and participation (3%), Lab homework and research training (6%), and the Data Analysis Project (21%). An unexcused absence for an exam, or not turning in assigned study problems, will result in extra penalties.

According to departmental policy, “any student who must repeat a required course to attain the required grade of at least C- will be allowed only one opportunity to do so” (Bulletin, 2019 - 2020, p. 419).

### Tests

There will be a total of 7 tests, covering material that will be presented in the lecture portion of the course. In order to provide for some flexibility during the Fall 2020 semester, you will be able to drop your one lowest test grade. You may exercise this option even if you miss one exam due to personal illness or potential disruption if students are required to vacate campus due to worsening COVID conditions.

All tests, except for the last test during Exam Week, will be held during a Friday class period. The tests will be held synchronously (i.e., from 8:55 until 9:45 am Eastern Standard Time). Absence from an exam is only allowed with prior notification and consent of the instructor. When allowed, missed exams must be made up within one week of the original exam date.

### Attendance policy

**Attendance at all lecture sessions is mandatory, and all lecture sessions will be synchronous** due to College policy, even though the course is “remote”. Lecture sessions will consistently involve interactive, small-group activities, with opportunities for students to ask questions and receive regular feedback on their problem-solving efforts. Class homework assignments will be collected on Moodle (see below). If you are not able to attend a class due to serious illness or uncontrollable circumstances, please notify the instructor before the session you will miss, so that make-up/catch-up arrangements can be made.

Please see the lab syllabus for additional information about the policies regarding attendance, promptness, and participation.

### Course preparation expectations

“One Trinity course credit is the equivalent of 3.5 semester hours, or approximately 157.5 hours of student engagement per semester, as defined by federal guidelines. For each credit hour awarded, students generally complete no fewer than 150 minutes of in-class instructional or studio/lab time, **and 9 hours of unsupervised out-of-class work per week**, including final exams, final projects, take home examinations etc.” – (Bulletin, 2019 – 2020, p. 58, emphasis added).

### Class Homework assignments

There will be frequent homework assignments for class. Class assignments will include written responses to quantitative problems from (or similar to those in) the Welkowitz, Cohen, and Lea text, as well as methodological issues posed in the Morling text. Class assignments will be due on Moodle at the beginning of the class session for which they are due.

All assignments must be submitted in PDF or Word format via Moodle. I will not accept assignments in any other format (e.g., .jpeg) or through other modalities (e.g., email). All assignments must be submitted as a single (1) file; that is, I will not accept individual pages of an assignment. If you prefer to submit your assignment as a PDF, there are a variety of smartphone apps that can be used, such as TurboScan or Tiny Scanner. When uploading/scanning documents, ensure that they are legible and that the edges are not cut off. I recommend using dark ink and leaving at least 0.5" margin to ensure that your work can be read. If I cannot read your submission, I will not be able to grade it. For remote help with technology-related issues, please visit Trinity's Remote Learning website (<https://edtech.domains.trincoll.edu/a-students-guide-to-remote-learning/>) or email [sta-help@trincoll.edu](mailto:sta-help@trincoll.edu).

When submitting assignments, use the following labeling convention:

"LASTNAME.FIRSTNAME\_COURSE\_ASSIGNMENT\_DATE." For example, if I were submitting "Problem Set 1" for PSYC 221 on September 16, 2020, the assignment would be titled as follows:

"REUMAN.DAVID\_PSYC221\_PROBLEMSET1\_16SEPT2020."

Homework assignments for class will be evaluated on the following scale:

90-100% of possible points	=	A
80-89% of possible points	=	B
70-79% of possible points	=	C
60-69% of possible points	=	D
less than 60% of possible points	=	F
Missing	=	F with penalty points

You may always turn in your homework in order to get feedback on how you are doing. However, there will be deductions for lateness. If a class homework assignment is late by one class meeting (or less), the grade will drop by 1 letter grade (i.e., a "B" will be lowered to a "C"). If a class homework assignment is late by more than one class meeting but less than one week (7 days), the grade will drop by 2 letter grades. Class homework that is late by one week or more will be treated as missing.

Please see the lab syllabus for additional information about lab homework assignments, as well as how such assignments will be graded. The lateness policy for lab homework assignments is also included on the lab syllabus.

#### Extra credit

You may earn extra credit by participating in psychological research. In order to earn the credit, you must (1) write a brief description of what your participation involved and an evaluation of the investigation's design or procedures, and (2) ensure that the research investigator confirms your participation. Extra credit may be applied to raise your grade (from whatever you received to A) on as many as 2 class homework assignments, provided that you had turned in the assignment(s) on time.

#### Data analysis project

Please see the lab syllabus for information about the data analysis project.

#### Research ethics certification

You must complete online training for conducting research by **October 12 (Monday lab) or October 13 (Tuesday lab)**. Trinity's IRB requires you to complete the Basic Course for "Human Subjects Research – Social-Behavioral-Educational (SBE) Modules" from the Collaborative Institutional Training Initiative (CITI). The information and quizzes are online; the process takes between 4 and 6 hours in total and does not need to be done in one session (you can keep coming back to it). When you have passed the tutorial, post your certificate on the lab Moodle site.

**\*You must complete the CITI training to receive a grade for the course.**

#### Intellectual honesty

In this course you will be working together occasionally with your classmates to conduct analyses using SPSS and to solve problems involving quantitative reasoning and quantitative data analysis. There are assignments for which collaboration is acceptable and others that you must work on individually. Talk with Professor Reuman and Professor Senland anytime you're not sure. For example, while you may work with your classmates to complete in-class activities, you are expected to complete your exams independently. Copying work from another student (or students) during an exam, posting answers to exam questions online, or sharing exam answers with other students (using any method) is considered unauthorized collaboration. Unauthorized collaboration is considered intellectual dishonesty in the Student Handbook, and all students involved may be reported for a suspected Academic Integrity violation.



Be careful to avoid plagiarism. If you incorporate a published author's ideas or reviewers' suggestions in your work, be sure to give credit where credit is due in an acknowledgments section or your Reference section. If you use another person's words you must use quotation marks. Additionally, it is inappropriate and unethical to use another person's phrasing.

If you are not familiar with the College policy on academic dishonesty or are unclear about the definition of plagiarism, review your lab materials, **read the current Trinity College Student Handbook**, review the Student Integrity Contract, and **talk with Prof. Reuman and/or Prof. Senland**.

#### The Writing Center

You are encouraged to use the Writing Center, staffed by specially trained Writing Associates, to improve your writing – no matter your skill level. I suggest taking your writing projects to the Writing Center several times during the process of composing. To reserve an appointment via the online scheduling system use: <https://trincoll.mywconline.com/>. The main Writing Center is in room 109 of the English House at 115 Vernon Street. For more information about hours and Writing Associates, please visit: <http://writingcenter.trincoll.edu>. Drop-ins are welcome.

#### Students with Academic Accommodations

Trinity College is committed to creating an inclusive and accessible learning environment consistent with the Americans with Disabilities Act. Like many things, the need for disability accommodations and the process for arranging them may be altered by the COVID-19 changes we are experiencing and the safety protocols currently in place. Students with disabilities who may need some accommodation in order to fully participate in this class are urged to contact the Student Accessibility Resource Center, as soon as possible, to explore what arrangements need to be made to assure access. If you have approval for academic accommodations, please provide notification electronically using SARC Online during the first two weeks of the semester. For those students with accommodations approved after the start of the semester, a minimum of ten days notice is required prior to needing your accommodations. Following notification, students are required to meet with faculty to further discuss implementation of accommodations. If you do not have approved accommodations, but have a disability requiring accommodations, or have questions about applying, please contact Lori Clapis, Coordinator of Accessibility Resources at [Lori.Clapis@trincoll.edu](mailto:Lori.Clapis@trincoll.edu), or [SARC@trincoll.edu](mailto:SARC@trincoll.edu), or refer to the Student Accessibility Resources (SARC) website: <https://www.trincoll.edu/StudentLife/StudentAccessibilityResources/students>.

#### Disclaimer

This syllabus may change during the semester at the discretion of the instructor.