

ED PSY 826: Analysis of Categorical Data

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Office hours: By appointment; please contact me by e-mail to set up a time to meet as necessary.

This course will introduce students to data analysis techniques appropriate for categorical data (i.e., information measured in categories rather than on a continuous scale). The course will be taught from an applied perspective, and the objectives are to enable students to:

- Identify the most appropriate analysis for research questions pertaining to categorical data.
- Use statistical software to appropriately conduct the data analysis and interpret the statistical information.
- Clearly communicate the results of the statistical analyses to address the research questions of interest.

By the end of the course students should be able to identify the categorical analysis procedure most appropriate for a given research question and data set, carry out the analysis, and properly interpret the results. Students will be exposed to common categorical data analysis techniques that they may need to use in their own research or encounter in reading research articles.

Course web page: We will use a D2L site for this course. The site can be accessed at <http://d2l.uwm.edu/> and students should check the site on a regular basis. You can find instructions for D2L at <http://uwmltc.org/?p=870>.

Pre-requisites: A graduate-level statistics course (e.g., ED PSY 724) that included factorial ANOVA as well as multiple regression and statistical computing. A full course on ANOVA or regression is highly recommended.

Textbook: Azen, R., & Walker, C. M. (2010). Categorical Data Analysis for the Behavioral and Social Sciences, published by Psychology Press (Taylor & Francis).

- Optional: Agresti, A. (2007). An Introduction to Categorical Data Analysis, 2nd Edition. New York: Wiley.
- We may also discuss journal articles of interest to you that use categorical analysis procedures. If you have such articles, please submit them to me.

Computing: Students will be required to use some statistical software packages (such as SAS or SPSS). Students are expected to already be proficient in at least one software package. The emphasis in class will be on demonstrating the use of SAS, but students who wish to use other software are welcome to do so on their own.

Course structure and student evaluation:

Homework: Homework problem sets will generally be **assigned every week** and collected approximately every 2-3 weeks (due dates and assignments will be posted on the course web site, so check it regularly). The homework assignments consist of problems that are intended to give you some hands-on practice with the material. Each problem will be graded on a three-point scale to indicate the level of accuracy and understanding reflected in it:

Points	Description
3	Complete, clear and correct.
2	Some mistakes and/or misconceptions, somewhat unclear or incomplete.
1	Many mistakes and/or misconceptions, very unclear or incomplete.
0	Not done or barely attempted.

You need to make sure that you are clearly communicating your understanding in your answers (see separate document with [homework guidelines](#)). Homework grades and comments are designed to provide you with feedback on your level of understanding, but if you find the feedback insufficient it is **your responsibility** to make sure that you ask and understand the feedback. Do not put off getting help if you don't know how to do a problem or do not understand the feedback you received!

Late homework assignments will be accepted with a **10% point deduction** for each day they are late (in other words, you will lose 10% of the total number of points for the assignment for each day it is late). It is your responsibility to turn your homework in on the due date (even if you are absent)! Please communicate with me (the instructor) if your homework will be late.

A note on working with others: The goal of homework is to make sure you are learning and understanding the material, so it would defeat the purpose if you get the right answer but don't really understand why. Therefore, while you are allowed to discuss the concepts on homework assignments, it is recommended that you complete the assignments on your own. In addition, **the work you hand it must be your own**, and it is considered academic misconduct to submit anyone else's work (or words) as your own.

Class project: You will be asked to obtain a data set (preferably of interest to you and/or from your field of study) that can be analyzed using the approaches covered in the course. You will carry out the analysis, hand in a summary report, and present the results to the class at the end of the course. Students may, alternatively, choose a project topic that is more theoretical in nature (e.g., a simulation study of a relevant analytic method). The projects will be graded based on the accuracy of the analyses as well as the level of understanding demonstrated in the written summary and presentation to the class. Further details will be posted on the course web page.

Exams: There will be one mid-term exam as well as a final exam. These will be take-home exams. Students are expected to **complete the exams independently** and with the utmost regard for academic integrity. Take-home exams must be completed entirely on your own (i.e., they should be treated as if they are in-class) and violations of this will be considered academic misconduct.

There will be NO extra credit option in this course.

The weights assigned to each of these components will be:

Homework	25%
Project & participation	10%
Mid-term exam	30%
Final exam	35%

Using these weights, final scores (out of 100) will be computed and these will be converted to letter grades as follows:

A	A-	B+	B	B-	C+	C	C-	D+	D	D-	F
90-100	85-89	80-84	75-79	70-74	67-69	63-66	60-62	57-59	53-56	50-52	below 50

University Policies:

Policies regarding participation of students with disabilities, accommodations for religious observances, academic misconduct, student complaints, grade appeals, sexual harassment, attendance, and assignment of a grade of "incomplete" are available at <http://www.uwm.edu/Dept/SecU/SyllabusLinks.pdf>. **Students should review these policies at the start of the course.**

Time Investment:

This will vary by student and by week, but my expectation is that students will spend (in addition to time attending lectures) about 3 times the in-class time on readings and assignments, for a total of about 150 hours. Please click [here](#) for a more detailed breakdown. This is an estimated workload and students will be assessed on their performance (as indicated in the syllabus), not on the time put into the course

A note about cell phones:

As a courtesy to the instructor and your fellow students, please *turn OFF your cell phone ringer* during class. If you must have it on for emergencies, please make sure that no one calls you for any reason other than a true emergency.

Tentative Schedule

Week	Date	Topic	Reading*
1	Sept. 8	Introduction; scales of measurement; sampling models	A&W: Chapters 1, 2 A: Sections 1.1-1.2, 11.1-11.2
2	Sept. 15	Inference for a proportion	A&W: Chapter 3 A: Sections 1.3-1.4
3	Sept. 22	Two-way contingency tables: structure, proportions, odds-ratio	A&W: Sections 4.1-4.3 A: Sections 2.1-2.3
4	Sept. 29	Inference: tests of independence	A&W: Sections 4.4-4.9 A: Sections 2.4, 2.6
5	Oct. 6	Three-way contingency tables	A&W: Chapter 5 A: Section 2.7
6	Oct. 13	Three-way contingency tables	A&W: Chapter 5 A: Section 2.7
7	Oct. 20	Generalized linear models Mid-term exam handed out	A&W: Chapter 6 A: Chapter 3
8	Oct. 27	Log-linear models	A&W: Chapter 7 A: Chapter 7
9	Nov. 3	Log-linear models Mid-term exam due	A&W: Chapter 7 A: Chapter 7
10	Nov. 10	Logistic regression (continuous)	A&W: Chapter 8 A: Sections 4.1-4.2, 4.4-4.5, Chapter 5
11	Nov. 17	Logistic regression (categorical)	A&W: Chapter 9 A: Sections 4.3, 5.3.1, 7.3
12	Nov. 24	~ Thanksgiving break ~	
13	Dec. 1	Project presentations Final exam handed out	
14	Dec. 8	Project presentations & projects due Multicategory logit models (time permitting)	A&W: Chapter 10 A: Chapter 6

*Note: A&W = Azen & Walker (2010); A = Agresti (2007)