Syllabus
GSBA 625: Experimental Design and Analysis for Behavioral Science
Fall 2022 (3 units)

Professors:	Erin Frey	Kristin Diehl
Office:	HOH 505	HOH 324
Office Hours:	By appointment	By appointment
Contact:	elfrey@marshall.usc.edu	kdiehl@marshall.usc.edu

Class Day and Time

Day: Monday
Time: 1:00 – 3:50 PM (2 hours 50 minutes)
Location: HOH 706

Course Description

This course provides an overview of the design, implementation, and statistical analysis of experiments for Ph.D. students. The first half of the course is devoted to understanding fundamental design issues and the various issues that arise when operationalizing one's experiment. These issues include measuring dependent variables, as well as measurement issues related to mediators and covariates; proper manipulation of independent variables; choice, recruitment, and treatment of experimental participants; and proper experimental procedures including methods for avoiding demand/experimenter expectancy effects and minimizing noise. The second half of the course is devoted to understanding statistical analysis of experimental data using different statistical programs (SPSS, SAS, R). Analyses covered will include ANOVA for both between- and within-participants studies with manipulated and measured factors, ANCOVA, mediation analyses, factor and reliability analysis, as well as discrimination analyses.

Course Learning Objectives

The overall goal of this course is to introduce you to the key issues related to designing and running experiments. Subsumed under this goal are several specific learning objectives and desired outcomes related to those objectives:

- You should gain factual knowledge of important terminology related to experiments, including, for example: internal validity, statistical conclusion validity, construct validity, external validity, random assignment, noise variables, between-participants design, within-participants design, fully-crossed factorial design, main effect, interaction, planned contrasts, post hoc comparisons, manipulation, measurement, measurement error, reliability, confound, mediator, moderator, covariate, manipulation check, self-report measure, behavioral measure, common method biases, etc.
    - *The desired outcome for this objective is that you be able to articulate the definitions of these concepts.*

- You should learn fundamental principles related to designing and running experiments. These fundamental principles are among the specific skills and competencies needed by experimental researchers. These principles include those related to the choice of a design based on one's research question and other factors, as well as the analysis technique that is appropriate for that design; proper manipulation of independent variables; proper measurement of dependent and

other variables; proper control of noise and correlated omitted variables; proper experimental procedures; procedures for maintaining data integrity, etc.

- o *The desired outcome for this objective is that you be able to explain these principles and apply several of them in an introductory fashion.*

- You should learn to apply the above terminology to novel situations. This would include the ability to recognize, based on your understanding of terminology, whether something you read employs repeated measures design, etc. More important, you should also learn to apply the above principles to novel situations and begin to learn how to apply the above principles to your own experimental research – this would include determining whether another researcher (or you yourself) have chosen a proper design, properly measured or manipulated variables, used proper controls, etc.
  - o *The desired outcome for these objectives is that you be able to classify "good" (or "present") vs. "bad" ("absent") examples of important terminology and principles, e.g., whether a study has properly measured a specific type of dependent variable (e.g., one that is subject to social desirability bias). An additional desired outcome is that you can begin to properly apply the principles to your own work. You obviously cannot completely learn all there is to know about experiments in a one-semester course. This is why our objective is that you can begin to do these things.*

- You should gain an understanding of the analyses and analysis tools you will use for the majority of your experimental data analysis needs. Each topic can and will be covered in specialized classes in greater detail, but this class will teach you how to conduct analyses for standard designs. Further, you should learn to properly interpret null hypothesis significance tests and effectively communicate your results.
  - o *The desired outcome for these objectives is that you be able to conduct standard data analysis for common designs using a statistical software package, interpret the results correctly, and be able to report them for an academic audience.*

To achieve the above learning objectives, we will employ a combination of background reading, interactive lecture, written work, and prompt feedback. Because research on learning indicates that having an initial conceptual framework substantially improves later learning, we will lecture to establish the framework and clarify the terminology and principles embedded therein. We expect questions during lectures. However, because our learning objectives include fostering your ability to apply terminology and principles to your own work, there also will be quite a bit of written work and feedback from us on that work. Research on learning indicates that it is very difficult to gain anything more than a superficial understanding of (i.e., memorize) material without practice and feedback. The best combination of techniques for learning difficult material deeply, then, is the introduction of the framework up front, followed by practice and feedback. Most classes also will contain some sort of in-class activities as well, including the discussion of published experimental studies, critiquing manipulations and measures, and running analyses.

Finally, note class sessions also have readings labeled "OPTIONAL." These readings are not required; they are only if you'd like to follow up on a particular topic we will be mentioning in class.

Required Materials
There are no required texts for this course. You will be assigned readings from texts, as well as from psychology and business journals (listed in detail below). These materials will be distributed to you well ahead of time (on Blackboard). You also may want to consider purchasing the following texts for your

library at some point (if you do not already own them), as they are among the standard/classic references for experimental researchers:

- Shadish, W., Cook, T., and Campbell, D. Experimental and Quasi-Experimental Designs for Generalized Causal Inference. Boston, MA: Houghton Mifflin. 2002.
- Kerlinger, F., and Lee, H. Foundations of Behavioral Research (4th edition). Fort Worth, TX: Holt, Rinehart and Winston. 2000.
- Wickens, T. D., & Keppel, G. (2004). Design and analysis: A researcher's handbook. Upper Saddle River, NJ: Pearson Prentice-Hall.
- Kirk, R. Experimental Design: Procedures for the Behavioral Sciences (4th edition). Pacific Grove, CA: Brooks/Cole Publishing Company. 2012.
- Nunnally, J., and Bernstein, I. Psychometric Theory (3rd edition). Boston, MA: McGraw-Hill. 1994.
- Winer, B., Brown, D., and Michels, K. Statistical Principles in Experimental Design (3rd edition). Boston, MA: McGraw-Hill. 1991.
- Cohen, J. Statistical Power Analysis for the Behavioral Sciences (2nd edition). Hillsdale, NJ: Lawrence Erlbaum. 1988.
- Siegel, S., and Castellan, N., Jr. Nonparametric Statistics for the Behavioral Sciences (2nd edition). Boston, MA: McGraw-Hill. 1988.

For each topic we cover, there are hundreds of additional readings. Thus, we have listed only a few OPTIONAL readings. However, you should feel free to inquire further about any topic in which you have a particular interest.

Statistical Analysis Tools
There are a number of software tools available to you. They all have advantages (e.g., open source/free, flexible, easy to use), as well as disadvantages (e.g., pricey, requires programming, not flexible, etc.). In different classes, you may encounter different programs. For experimental research, you likely will mainly encounter SAS, SPSS, and R. Ultimately, you have to pick one package/language you are "native" in, but you should be able to use or at least understand other languages too as your co-authors may use a different package or you may find that certain analyses are easier in one tool than another. We will work through data analyses in SPSS, but if you are more comfortable with another language you are welcome to use those tools. For the second half of the class (week 8 onward), we will do hands-on data analysis. For those classes, please bring a laptop to class and have SPSS installed. Prior to class, you should have loaded the data to be used so that you are ready to roll in class.

- SPSS -- Free to USC students, https://itservices.usc.edu/stats/spss/).
- SAS -- Free to USC students (https://itservices.usc.edu/stats/sas/).
- R -- You will need to download and install R (https://cran.r-project.org) and RStudio (Rstudio Desktop: Open Source License; www.rstudio.com), both of which are free

Specialized programs and packages:
- PROCESS -- For mediation analyses a popular tool is the PROCESS macro by Andrew Hayes (http://processmacro.org/index.html). These macros are available for SPSS, SAS, and recently also for R. There are also other R-packages that follow a similar approach.
- G-Power -- G-Power is a tool to compute statistical power analyses for many different tests. Useful when trying to determine target sample sizes (http://www.psychologie.hhu.de/arbeitsgruppen/allgemeine-psychologie-undarbeitspsychologie/gpower.html)

Prerequisites and/or Recommended Preparation

This course does not have any particular prerequisites or recommended preparation. However, it is important to be interested in developing an understanding of the psychology of thinking when designing experiments so that you understand how people will respond to your materials. Thus, as relevant topics related to thinking come up (e.g., how information in memory is activated), we will briefly cover them.

Classroom Policies

Active class participation is important in achieving the learning objectives for this course. Unless students provide an accommodation letter from USC OSAS or from Marshall detailing visa or travel restrictions, attendance and active participation is expected in the classroom. Any student with such accommodations should submit their accommodation document to their instructor as soon as possible. We will then provide regular access to a recording of the class and an opportunity to regularly make up missed in-class participation.

Students who are experiencing illness should not attend class in person. Please inform us in advance of the class session to discuss what accommodations will be made to allow for the make-up of missed class work and missed in-class participation. Students will not be penalized for not attending class in person under these circumstances.

Course Notes

We will post copies of slides and other handouts to Blackboard approximately 30 minutes before class each day. We will also bring paper copies of slides to class if you prefer to take notes by hand. All readings will be posted on Blackboard at least a week in advance. Again, please make sure that you are able to access Blackboard.

Finally, we will communicate with you through Blackboard (which is connected to your USC email account). Please make sure that you have your USC email forwarded to another account if you do not check your USC email account frequently.

Grading Policies

Total points for this course are 1000. Your letter grade will be determined based on your relative performance (vis-à-vis your peers).

Component	Points
• Individual, Written assignments	900
• Class participation	100
Total	**1000**

Our expectations for performance in each component of this class are as follows. This course requires six written assignments because of the challenging nature of the learning objectives (see above). There are 900 points allocated to these assignments. We will be grading each assignment on whether you completed all parts of the assignment, the effort you put into the assignment as exhibited by your thoroughness and depth of thought, and, to a lesser extent, accuracy of application of concepts, in cases where we have covered the material pertinent to the assignment in some depth prior to the assignment being due. In other words, we are not necessarily looking for you to always get a "right answer" unless we clearly have covered the material prior to the assignment, but rather that you are working hard and putting forth your

best effort to learn. Assignments are due by the beginning of class on the date indicated, even if you must miss class. We will grade your assignments and provide feedback on them as promptly as possible.

Next, 100 points are allocated to general class participation. Our expectations for this participation grade are that you will have read the background readings thoroughly and you will be prepared to ask and answer questions. Your preparedness can be exhibited voluntarily or involuntarily (i.e., we will call on you). The main criterion for grading participation is effort, as exhibited by thoroughness of preparation and depth of thought. In discussions there often is no "right answer," so little weight will be placed on an accuracy criterion.

Assignment Submission Policy
Assignments must be turned in as of the specified time on the specified date via email directly to us. Late assignments receive no credit.

ADDITIONAL GUIDELINES

Add/Drop Process
This course may be added or dropped by the student.

Retention of Graded Coursework
Assignments will be retained for one year after the end of the course, consistent with University policy.

Emergency Preparedness/Course Continuity
In case of a declared emergency if travel to campus is not feasible, the *USC Emergency Information* web site (http://emergency.usc.edu/) will provide safety and other information, including electronic means by which instructors will conduct class using a combination of USC's Blackboard learning management system (blackboard.usc.edu), teleconferencing, and other technologies.

Academic Integrity
The University of Southern California is foremost a learning community committed to fostering successful scholars and researchers dedicated to the pursuit of knowledge and the transmission of ideas. Academic misconduct is in contrast to the university's mission to educate students through a broad array of first-rank academic, professional, and extracurricular programs and includes any act of dishonesty in the submission of academic work (either in draft or final form).

This course will follow the expectations for academic integrity as stated in the USC Student Handbook. All students are expected to submit assignments that are original work and prepared specifically for the course/section in this academic term. You may not submit work written by others or "recycle" work prepared for other courses without obtaining written permission from the instructor(s). Students suspected of engaging in academic misconduct will be reported to the Office of Academic Integrity.

Other violations of academic misconduct include, but are not limited to, cheating, plagiarism, fabrication (e.g., falsifying data), knowingly assisting others in acts of academic dishonesty, and any act that gains or is intended to gain an unfair academic advantage.

The impact of academic dishonesty is far-reaching and is considered a serious offense against the university and could result in outcomes such as failure on the assignment, failure in the course, suspension, or even expulsion from the university.

For more information about academic integrity see the student handbook or the Office of Academic Integrity's website, and university policies on Research and Scholarship Misconduct.

Since creating, analytical, and critical thinking skills are part of the learning outcomes of this course, all assignments should be prepared by the student working individually or in groups. Students may not have another person or entity complete any substantive portion of the assignment. Developing strong competencies in these areas will prepare you for a competitive workplace. Therefore, using AI-generated tools is prohibited in this course, will be identified as plagiarism, and will be reported to the Office of Academic Integrity.

Please ask if you are unsure what constitutes unauthorized assistance on an exam or assignment, or what information requires citation and/or attribution.

Use of Recordings

Pursuant to the *USC Student Handbook* (https://policy.usc.edu/studenthandbook/, page 57), students may not record a university class without the express permission of the instructor and announcement to the class. In addition, students may not distribute or use notes or recordings based on USC classes or lectures without the express permission of the instructor for purposes other than personal or class-related group study by individuals registered for the class. This restriction on unauthorized use applies to all information that is distributed or displayed for use in relationship to the class. Violation of this policy may subject an individual or entity to university discipline and/or legal proceedings.

Open Expression and Respect for All

An important goal of the educational experience at USC Marshall is to be exposed to and discuss diverse, thought-provoking, and sometimes controversial ideas that challenge one's beliefs. In this course we will support the values articulated in the USC Marshall "Open Expression Statement" (https://www.marshall.usc.edu/open-expression-statement).

Students and Disability Accommodations:

USC welcomes students with disabilities into all of the University's educational programs. The Office of Student Accessibility Services (OSAS) is responsible for the determination of appropriate accommodations for students who encounter disability-related barriers. Once a student has completed the OSAS process (registration, initial appointment, and submitted documentation) and accommodations are determined to be reasonable and appropriate, a Letter of Accommodation (LOA) will be available to generate for each course. The LOA must be given to each course instructor by the student and followed up with a discussion. This should be done as early in the semester as possible as accommodations are not retroactive. More information can be found at osas.usc.edu. You may contact OSAS at (213) 740-0776 or via email at osasfrontdesk@usc.edu.

Support Systems:

[Counseling and Mental Health](#) - *(213) 740-9355 – 24/7 on call*

Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention.

[988 Suicide and Crisis Lifeline](#) - *988 for both calls and text messages – 24/7 on call*

The 988 Suicide and Crisis Lifeline (formerly known as the National Suicide Prevention Lifeline) provides free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week, across the United States. The Lifeline is comprised of a national network of over 200 local crisis centers, combining custom local care and resources with national standards and best practices. The new, shorter phone number makes it easier for people to remember and access mental health crisis services (though the previous 1 (800) 273-8255 number will continue to function indefinitely) and represents a continued commitment to those in crisis.

[Relationship and Sexual Violence Prevention Services (RSVP)](#) - *(213) 740-9355(WELL) – 24/7 on call*

Free and confidential therapy services, workshops, and training for situations related to gender- and power-based harm (including sexual assault, intimate partner violence, and stalking).

[Office for Equity, Equal Opportunity, and Title IX (EEO-TIX)](#) - *(213) 740-5086*

Information about how to get help or help someone affected by harassment or discrimination, rights of protected classes, reporting options, and additional resources for students, faculty, staff, visitors, and applicants.

[Reporting Incidents of Bias or Harassment](#) - *(213) 740-5086 or (213) 821-8298*

Avenue to report incidents of bias, hate crimes, and microaggressions to the Office for Equity, Equal Opportunity, and Title for appropriate investigation, supportive measures, and response.

[The Office of Student Accessibility Services (OSAS)](#) - *(213) 740-0776*

OSAS ensures equal access for students with disabilities through providing academic accommodations and auxiliary aids in accordance with federal laws and university policy.

[USC Campus Support and Intervention](#) - *(213) 740-0411*

Assists students and families in resolving complex personal, financial, and academic issues adversely affecting their success as a student.

Diversity, Equity and Inclusion - *(213) 740-2101*

Information on events, programs and training, the Provost's Diversity and Inclusion Council, Diversity Liaisons for each academic school, chronology, participation, and various resources for students.

USC Emergency - *UPC: (213) 740-4321, HSC: (323) 442-1000 – 24/7 on call*

Emergency assistance and avenue to report a crime. Latest updates regarding safety, including ways in which instruction will be continued if an officially declared emergency makes travel to campus infeasible.

USC Department of Public Safety - *UPC: (213) 740-6000, HSC: (323) 442-1200 – 24/7 on call*

Non-emergency assistance or information.

Office of the Ombuds - *(213) 821-9556 (UPC) / (323-442-0382 (HSC)*

A safe and confidential place to share your USC-related issues with a University Ombuds who will work with you to explore options or paths to manage your concern.

Occupational Therapy Faculty Practice - *(323) 442-2850 or* otfp@med.usc.edu

Confidential Lifestyle Redesign services for USC students to support health promoting habits and routines that enhance quality of life and academic performance.

COURSE SCHEDULE

Class 1	August 21	Introduction to scientific research – research questions, theory, causality, types of variables	
Class 2	August 28	Designs and methods to answer research questions; validity issues	
----	September 4	No Class (Labor Day)	
Class 3	September 11	Validity issues (continued); overview of experimental designs; single-factor randomized designs and overview of ANOVA	
Class 4	September 18	Basics of construct validity; introduction to manipulations	Assignment 1 due
Class 5	September 25	Constructing manipulations	
Class 6	October 2	Overview of types of measures used in experiments; self-reported, subjective measures	
Class 7	October 9	Tests; Open-ended responses; behavioral measures; measurement issues with mediators	Assignment 2 due
Class 8	October 16	Integrity in the research process	
Class 9	October 23	Analysis: 1 factor and 2 factor ANOVA	Assignment 3 due
Class 10	October 30	Analysis: ANOVA (part 2, continuous moderators)	
Class 11	November 6	Analysis: Examination of process -mediation analysis, chain of experiments	Assignment 4 due
Class 12	November 13	Analysis: Factor analysis, Cronbach's alpha, Cohen's Kappa, Discriminant analysis	
Class 13	November 20	Analysis: ANCOVA, within-participants ANOVA	Assignment 5 due
Class 14	November 27	Class review and wrap-up	
	December 4		Assignment 6 due

Class 1 (August 21)
Topics: Introduction to scientific research – research questions, theory, causality

<u>**Required Background Readings:**</u>

- Creswell, J. *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches* (4th edition). Thousand Oaks, CA: Sage Publications, 2014. [*skim pages 5-11, focus on pages 52-55, 111-112, 143-146*]

- Edmondson, A. C., & McManus, S. E. (2007). Methodological fit in management field research. *Academy of Management Review*, 32(4), 1246-1264.

- Kerlinger, F. and Lee, H. *Foundations of Behavioral Research* (4th ed.). Fort Worth, TX: Harcourt College Publishers, 2000. [*Chapter 1*]

- Jaccard, J. and Jacoby, J. *Theory Construction and Model-Building Skills*. New York: Guilford Press, 2010. [*pages 10-16, 28- 33, 45-47, 79-82, 85-87, 137-153*].

- Trochim, W., Donnelly, J., and Arora, K. *Research Methods: The Essential Knowledge Base*. Boston: Cengage Learning, 2016. [*pages 15-20*]

- Sutton, R. and Staw, B. "What Theory is Not." *Administrative Science Quarterly* (1995), 371-384.

- Whetten, D. "What Constitutes a Theoretical Contribution?" *Academy of Management Review* (1989), 490-495.

<u>**Required Reading for Discussion in Class:**</u>

- Grant, A. M., Campbell, E. M., Chen, G., Cottone, K., Lapedis, D., & Lee, K. (2006). "Impact and the art of motivation maintenance: The effects of contact with beneficiaries on persistence behavior." *Organizational Behavior and Human Decision Processes*.

- Manuscript Evaluation Form

<u>**Optional Reading:**</u>

- Alvesson, M. and Sandberg, J. Constructing Research Questions: Doing Interesting Research. Thousand Oaks, CA: Sage Publications, 2013, various excerpts about generating research questions.

- Booth, W., Colomb, G.., and Williams, J. The Craft of Research (3rd ed.). Chicago: The University of Chicago Press, 2008, various excerpts about turning broad research questions into narrower ones.

- Curd, M., Cover, J., and Pincock, C. Philosophy of Science: The Central Issues (2nd ed.). New York: W.W. Norton, 2013, various excerpts on philosophy.

- Deetz, S. "The Social Production of Knowledge and the Commercial Artifact." In L. Cummings and P. Frost (Eds.), Publishing in the Organizational Sciences. Thousand Oaks, CA: Sage Publications, 1995, 44-63.

- Jaccard, J. and Jacoby, J. Theory Construction and Model-Building Skills. New York: Guilford Press, 2010, 40-67, more on generating research questions

- McGuire, W. "Creative Hypothesis Generating in Psychology: Some Useful Heuristics." Annual Review of Psychology (1997), 1-30 – ditto.

- Manuscript evaluation form – you can use this to help you keep track of key elements of papers (and to evaluate them)

- Platt, J. "Strong Inference," Science (1964), pp. 347-353.

Class 2 (August 28)
Topics: Designs and methods to answer research questions; validity issues

Required Background Readings:

- Anderson, C., J. Lindsay, and B. Bushman, "Research in the Psychological Laboratory: Truth or Triviality?" Current Directions in Psychological Science (1999), 3-9.

- Mitchell, G., "Revisiting Truth or Trivality: The External Validity of Research in the Psychological Laboratory," Perspectives on Psychological Science (2012), 109-117

- Shadish, W., Cook, T., and Campbell, D. Experimental and Quasi-Experimental Designs for Generalized Causal Inference. Boston, MA: Houghton Mifflin. 2002, 103-110, 115-122, 246-252, 257-259.

- Trochim, W., Donnelly, J., and Arora, K. Research Methods: The Essential Knowledge Base. Boston: Cengage Learning, 2016, 206-215, 281-286.

Required Reading for Discussion in Class:

- Grant, A. M., Campbell, E. M., Chen, G., Cottone, K., Lapedis, D., & Lee, K. (2006). "Impact and the art of motivation maintenance: The effects of contact with beneficiaries on persistence behavior." *Organizational Behavior and Human Decision Processes*. [review from last class]

- Barasch, A., Zauberman, G., & Diehl, K. (2018). How the intention to share can undermine enjoyment: Photo-taking goals and evaluation of experiences. Journal of Consumer Research, 44(6), 1220-1237.

Optional Reading:

- Argo, J., D. Dahl, and A. Morales, "Consumer Contamination: How Consumers React to Products Touched by Others," Journal of Marketing (April 2006), 81-94, clever experiment WRT external validity.

- Shadish, W., "Campbell and Rubin: A Primer and Comparison of Their Approaches to Causal Inference in Field Settings," Psychological Methods (2010), 3-17, comparison of SCC approach to demonstrating causality to approach sometimes used by economists

September 4 - NO CLASS (Labor Day)

Class 3 (September 11)
Topics: Validity issues (continued); overview of experimental designs; single-factor randomized designs and overview of ANOVA

Required Background Readings:

- Rosenthal, R., and R. Rosnow, Essentials of Behavioral Research: Methods and Data Analysis (2008), Ch. 14.

- Shadish, W., T. Cook, and D. Campbell. Experimental and Quasi-Experimental Designs for Generalized Causal Inference. Boston, MA: Houghton Mifflin. 2002, 261-265.

- Christensen, L., "Types of Designs Using Random Assignment," in H. Cooper (Ed)., APA Handbook of Research Methods in Psychology, Volume 2 (2012) – more details about various designs

- Trochim, W., Donnelly, J., and Arora, K. Research Methods: The Essential Knowledge Base. Boston: Cengage Learning, 2016, 230-253.

- Wilkinson, L. et al., "Statistical Methods in Psychology Journals: Guidelines and Explanations." American Psychologist (1999), 594-604.

Required Reading for Discussion in Class:

- Lount Jr, R. B., & Pettit, N. C. (2012). The social context of trust: The role of status. *Organizational Behavior and Human Decision Processes*, *117*(1), 15-23.

Optional Reading:

- Andersen, R., "Methods for Detecting Badly Behaved Data: Distributions, Linear Models, and Beyond," in H. Cooper, APA Handbook of Research Methods in Psychology, Volume 3 (2012) – more on assumptions

- Jaccard, J. and K. Daniloski, "Analysis of Variance and the General Linear Model," in H. Cooper, APA Handbook of Research Methods in Psychology, Volume 3 (2012) -- more details about ANOVA.

Class 4 (September 18)
Topics: Basics of construct validity; introduction to manipulations

<u>**Required Background Readings:**</u>

- Bringmann, L.F., Elmer, T., & Eronen, M.I. (2022). Back to Basics: The Importance of Conceptual Clarification in Psychological Science. *Current Directions in Psychological Science*. 1-7.

- Podsakoff, P., S. MacKenzie, and N. Podsakoff, "Recommendations for Creating Better Concept Definitions in the Organizational, Behavioral, and Social Sciences" Organizational Research Methods (2016), 159-203. Ignore the detailed examples presented in the tables; just focus on the main strategies. We will use these in class.

- Trochim, W., J. Donnelly, and K. Arora, Research Methods: The Essential Knowledge Base (2016), 112 115, 127-141.

- Wilson, T., E. Aronson, and K. Carlsmith, "The Art of Laboratory Experimentation," in S. Fiske, D. Gilbert, and G. Lindzey (Eds.), Handbook of Social Psychology, Vol. 1 (2010) – read through p. 60.

<u>**Required Reading for Discussion in Class:**</u>

Review the following papers (from previous weeks), paying attention to the constructs developed in each:

- Grant, A. M., Campbell, E. M., Chen, G., Cottone, K., Lapedis, D., & Lee, K. (2006). "Impact and the art of motivation maintenance: The effects of contact with beneficiaries on persistence behavior." *Organizational Behavior and Human Decision Processes*. [review from last class]

- Barasch, A., Zauberman, G., & Diehl, K. (2018). How the intention to share can undermine enjoyment: Photo-taking goals and evaluation of experiences. Journal of Consumer Research, 44(6), 1220-1237.

- Lount Jr, R. B., & Pettit, N. C. (2012). The social context of trust: The role of status. *Organizational Behavior and Human Decision Processes*, *117*(1), 15-23.

<u>**Optional Reading:**</u>

- Grimm, K. and K. Widaman, "Construct Validity," In H. Cooper (Ed.), APA Handbook of Research Methods in Psychology, Vol. 1 (2012) – more on basics.

- Hayes, H. and S. Embretsen, "Psychological Measurement: Scaling and Analysis," in H. Cooper (Ed.), APA Handbook of Research Methods, Vol. 1 (2012) – more on scales.

- Le, H., F. Schmidt, J. Harter, and K. Lauver, "The Problem of Empirical Redundancy of Constructs in Organizational Research: An Empirical Investigation," Organizational Behavior and Human Decision Processes (2010), 112-125 – more on construct clarity.

- Locke, E. (2021) "Construct Validity vs. Concept Validity," Human Resource Management Review (2012), 146-148 – ditto.

- Suddaby, R. "Editor's Comments: Construct Clarity in Theories of Management and Organization," Academy of Management Review (2010), 346-357 – ditto.

Class 5 (September 25)
Topic: Constructing manipulations

Required Background Readings:

- Edlund, J., B. Sagarin, J. Skowronski, S. Johnson, and J. Kutter, "Whatever Happens in the Laboratory Stays in the Laboratory: The Prevalence and Prevention of Participant Crosstalk," Personality and Social Psychology Bulletin (2009), 635-642.

- Hughes, R. and M. Huby. "The Construction and Interpretation of Vignettes in Social Research." Social Work & Social Sci. Review (2004), 36-51.

- LeBlanc, G., "Once in a Blue Mood." Oprah Magazine (August 2009), 96.

- Wilson, T., E. Aronson, and K. Carlsmith, "The Art of Laboratory Experimentation," in S. Fiske, D. Gilbert, and G. Lindzey (Eds.), Handbook of Social Psychology, Vol. 1 (2010) – 63-72 (see class 4 for this article).

Required Reading for Discussion in Class:

- Koucaki, M., Smith-Crowe, K., Brief, A.P., & Sousa, C. 2013. Seeing green: Mere exposure for money triggers a business decision frame and unethical outcomes. *Organizational Behavior and Human Decision Processes*, 121: 53-61.

Optional Reading:

- Bargh, J. and T. Chartrand, "The Mind in the Middle: A Practical Guide to Priming and Automaticity Research," in H. Reis and C. Judd (Eds.), Handbook of Research Methods in Social and Personality Psychology. New York, NY: Cambridge University Press, 2000 – general article about use of priming

- Doyen, S., O. Klein, D. Simons, and A. Cleeremans, "On the Other Side of the Mirror: Priming in Cognitive and Social Psychology," in D. Molden (Ed.), Understanding Priming Effects in Social Psychology (2014) – ditto

- Gilbert, D., D. Krull, and P. Malone, "Unbelieving the Unbelievable: Some Problems in the Rejection of Information," Journal of Personality and Social Psychology (1990), 601-613 -- Clever cover story

- Morales, A., O. Amir, and L. Lee, "Keeping it Real in Experimental Research – Understanding When, Where, and How to Enhance Realism and Measure Consumer Behavior," Journal of Consumer Research (2017), 465-476 – discussion of when EV concerns are important and ways of enhancing EV in both manipulations and measures

Class 6 (October 2)
Topics: Overview of types of measures used in experiments; self-reported, subjective measures

Required Background Readings:

- Schwarz, N., "Self-Reports: How the Questions Shape the Answers," American Psychologist (1999), 93 105.

- Stone, A., J. Turkkan, C. Bachrach, J. Jobe, H. Kurtzman, and V. Cain (Eds.), The Science of Self-Report: Implications for Research and Practice. Mahwah, NJ: Lawrence Erlbaum, 2000, Chs.1, 3, 5.

- Trochim, W., J. Donnelly, and K. Arora, Research Methods: The Essential Knowledge Base (2016), 146-157 (NOTE: all of Ch. 6 is posted)

- Wilson, T., E. Aronson, and K. Carlsmith, "The Art of Laboratory Experimentation," in S. Fiske, D. G. Lindzey (Eds.), Handbook of Social Psychology, Vol. 1 (2010) – 72-75 (see class 4 for this article).

Required Reading for Discussion in Class:

Review from last class:
- Koucaki, M., Smith-Crowe, K., Brief, A.P., & Sousa, C. 2013. Seeing green: Mere exposure for money triggers a business decision frame and unethical outcomes. *Organizational Behavior and Human Decision Processes*, 121: 53-61.

Optional Reading:

- Rasinki, K., L. Lee, and P. Krishnamurty, "Question Order Effects," in H. Cooper (Ed)., APA Handbook of Research Methods in Psychology, Vol. 1 (2012) – details of order effects.

- Spector, P. Summated Rating Scale Construction: An Introduction. Newbury Park, CA: Sage, 1992, 1-12 – process for creating a scale.

Class 7 (October 9)
Topics: Tests; Open-ended responses; behavioral measures; measurement issues with mediators

Required Background Readings:

- Podsakoff, P., S. MacKenzie, J. Lee, and N. Podsakoff, "Common Method Biases in Behavioral Research: A Critical Review of the Literature and Recommended Remedies," Journal of Applied Psychology (2003), 879-903.

- Shoss, M., and M. Strube, "How do you Fake a Personality Test? An Investigation of Cognitive Models of Impression-Managed Responding," Organizational Behavior and Human Decision Processes (2011), 163-171.

- Trochim, W., J. Donnelly, and K. Arora, Research Methods: The Essential Knowledge Base (2016), 157-162 (see class 6 readings).

- Willis chapters "Introduction to Cognitive Interviewing"

Optional Reading:

- Bakeman, R. and V. Quera, "Behavioral Observation," in H. Cooper (Ed.), APA Handbook of Research Methods in Psychology, Vol. 1 (2012) – more details about behavioral measures and observational methods.

- Dunning, D., C. Heath, and J. Suls, "Flawed Self-Assessment: Implications for Health, Education, and the Workplace." Psychological Science in the Public Interest (December 2004), 69-106 – explains clearly why objective constructs like knowledge should not be measured with self-reports.

- Graesser, A., and D. McNamara, "Automated Analysis of Essays and Open-Ended Verbal Responses," in H. Cooper (Ed.), APA Handbook of Research Methods in Psychology, Vol. 1 (2012) – methods for analyzing these.

- Haladyna, T., Developing and Validating Multiple-Choice Test Items. Mahwah, NJ: Erlbaum. 2004, Chapters 1-4 – process for developing tests.

- Levinson, D., E. Stoll, S. Kindy, H. Merry, and R. Davidson, "A Mind You Can Count On: Validating Breath Counting as a Behavioral Measure of Mindfulness," Frontiers in Psychology (2014), 1-10 – example of developing behavioral measure

- Podsakoff, P., S. McKenzie, and N. Podsakoff. "Sources of Method Bias in Social Science Research and Recommendations on How to Control It." Annual Review of Psychology (2012), 539-569 – more technical version of earlier article.

Class 8 (October 16)   Integrity in the research process

Required Background Readings:

Simmons, J. P., Nelson, L. D., & Simonsohn, U. (2011). False-positive psychology: Undisclosed flexibility in data collection and analysis allows presenting anything as significant. Psychological Science, 22(11), 1359-1366.

Murayama, K., Pekrun, R., & Fiedler, K. (2014). Research practices that can prevent an inflation of false-positive rates. Personality and Social Psychology Review, 18(2), 107-118.

Klein, R. A., Ratliff, K. A., Vianello, M., Adams, R. B., Bahník, Š., Bernstein, M. J., Nosek, B. A. (2014). Investigating variation in replicability: A "Many Labs" replication project. Social Psychology, 45, 142–152. doi:10.1027/1864-9335/a000178

Schwarz, N., & Strack, F. (2014). Does merely going through the same moves make for a "direct" replication? Concepts, contexts, and operationalizations. Social Psychology, 45(4), 305–306.

Edlund, J. E., Cuccolo, K., Irgens, M. S., Wagge, J. R., & Zlokovich, M. S. (2022). Saving science through replication studies. Perspectives on Psychological Science, *17*(1), 216-225.

Prior to class:

1. Investigate the research integrity and data policy guidelines of a journal that you consider a future outlet. Bring a copy to class and be prepared to discuss the main points required by the journal and how they are related to the readings.
2. If you were an Editor, what three concrete steps/requests would you implement at the journal to assure research integrity

OPTIONAL LATER READING (if interested):

Nelson, L. D., Simmons, J., & Simonsohn, U. (2018). Psychology's renaissance. Annual review of psychology, 69, 511-534.
This provides a good background on when and why the discussion on p-hacking etc. exploded

Lynch Jr, J. G., Bradlow, E. T., Huber, J. C., & Lehmann, D. R. (2015). Reflections on the replication corner: In praise of conceptual replications. International Journal of Research in Marketing, 32(4), 333-342.

Abelson, R. P. (2012). *Statistics as principled argument*. Psychology Press, chapter 5
This book was originally published 1995. Shows you none of these issues are new.

Simonsohn, U., Nelson, L. D., & Simmons, J. P. (2014). P-curve: A key to the file-drawer. Journal of Experimental Psychology: General, 143(2), 534–547. https://doi.org/10.1037/a0033242
The authors suggest drawing a p-curve (a graph of the p-values of the studies in a paper) to assess the evidentiary support of a paper. Reviewer sometimes do that for an author's paper to suggest the evidence is not strong enough.

McShane, B, Bockenholt, U, & Hansen, K , "The p-curve is Not "Just Fine"", Blog post
http://blakemcshane.com/mbh.response2.pdf

Some arguments against the p-curve (in part in response to this blog post "P-curve Handles Heterogeneity Just Fine" (http://datacolada.org/67)

McShane, B. B., Böckenholt, U., & Hansen, K. T. (2020). Average power: A cautionary note. <u>Advances in Methods and Practices in Psychological Science</u>, 3(2), 185-199.

Class 9 (October 23) ANOVA

<u>**Required Background Readings:**</u>

1 Factor ANOVA

Keppel, Geoffrey, and Sheldon Zedeck. *Data analysis for research designs*. Macmillan, 1989.
  Chapter 6 (ANOVA approach)

2 Factor ANOVA

Keppel & Wickens (2004), <u>Design and Analysis: A Researchers Handbook</u>, (4th Edition) Upper Saddle River, NJ: Pearson/ Prentice Hall.
  Chapter 10 (Introduction to Factorial Designs)
  Chapter 11 (The Overall Two-Factor Analysis)

Effect size and Power

Cohen, J. (1992). A power primer. <u>Psychological Bulletin</u>, 112(1), 155-159.

McShane, B. B., Böckenholt, U. (2017). Single-Paper Meta-Analysis: Benefits for Study Summary, Theory Testing, and Replicability, <u>Journal of Consumer Research</u>, Volume 43, Issue 6, April 2017, Pages 1048–1063.

<u>**Prior to class**</u>:

Complete the pre-class data exercise.

<u>**Required Reading for Discussion in Class:**</u>

Raveendhran, R, Fast, N., Carnevale, P. (2020), Virtual (freedom from) reality: Evaluation apprehension and leaders' preference for communicating through avatars, <u>Computers in Human Behavior</u>, Volume 111, 106415

Valsesia, F., & Diehl, K. (2022). Let me show you what I did versus what I have: Sharing experiential versus material purchases alters authenticity and liking of social media users. <u>Journal of Consumer Research</u>, 49(3), 430-449

Barasch, A., Diehl, K., Silverman, J., & Zauberman, G. (2017). Photographic memory: The effects of volitional photo taking on memory for visual and auditory aspects of an experience. <u>Psychological Science</u>, 28(8), 1056-1066. **(focus on single paper meta-analysis)**

OPTIONAL LATER READING (if interested):

Faul, F., Erdfelder, E., Lang, A.-G., & Buchner, A. (2007). G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. Behavior Research Methods, *39*, 175-191.

GPower Manual

Sommet, N., Weissman, D. L., Cheutin, N., & Elliot, A. (2023). How many participants do I need to test an interaction? Conducting an appropriate power analysis and achieving sufficient power to detect an interaction. Advances in Methods and Practices in Psychological Science

Prentice, D. A., & Miller, D. T. (1992). When small effects are impressive. Psychological Bulletin, 112(1), 160.

Keppel, Geoffrey, and Sheldon Zedeck. *Data analysis for research designs*. Macmillan, 1989.
    Chapter 7 (Correlation/Regression approach– they call it MRC – Multiple Regression/Correlation)
This is a companion to the required reading. This particular stats book that specifically does everything the ANOVA way and the Multiple Regression way. While we know that they are doing similar things, the approach and interpretations are different.

These chapters can be helpful to "see the other side" (i.e., the regression side if you are an experimentalist and the ANOVA side if you are more comfortable with regression models) Also a good refresher on the one factor ANOVA model that Sarah introduced.

Class 10 (October 30) ANOVA (part 2, continuous moderators)
Required Background Readings:

Spiller, S. A., Fitzsimons, G. J., Lynch Jr, J. G., & McClelland, G. H. (2013). Spotlights, floodlights, and the magic number zero: Simple effects tests in moderated regression. Journal of Marketing Research, 50(2), 277-288.

Required Reading for Discussion in Class:

Catapano, Rhia, Zakary L. Tormala, and Derek D. Rucker. "Perspective taking and self-persuasion: Why "putting yourself in their shoes" reduces openness to attitude change." Psychological Science 30, no. 3 (2019): 424-435.

Lin, Y. T., MacInnis, D. J., & Eisingerich, A. B. (2020). Strong Anxiety Boosts New Product Adoption When Hope Is Also Strong. Journal of Marketing, 84(5), 60-78. **(read up to and including study 1)**

Review from Class 2:
Barasch, A., Zauberman, G., & Diehl, K. (2018). How the intention to share can undermine enjoyment: Photo-taking goals and evaluation of experiences. Journal of Consumer Research, 44(6), 1220-1237.

OPTIONAL LATER READING (if interested):

Aiken, L. S., West, S. G., & Reno, R. R. (1991). Multiple Regression: Testing and Interpreting Interactions. Sage. (it's out of print but worth tracking down, some chapters are posted)

Cohen, J., Cohen, P., West, S., Aiken, L. (2003). Applied Multiple Regression/Correlation Analysis for the Behavioral Sciences. New York: Routledge, https://doi-org.libproxy2.usc.edu/10.4324/9780203774441

Edwards, J. R. (2009). Seven deadly myths of testing moderation in organizational research. Statistical and methodological myths and urban legends: Doctrine, verity and fable in the organizational and social sciences, 143-164.

Irwin, J. & McClelland G. H. (2001) "Misleading Heuristics and Moderated Multiple Regression Models" Journal of Marketing Research, 38 (Feb), 100-109.

Pedhazur, E. J., & Schmelkin, L. P. (1991). *Measurement, design, and analysis: An integrated approach.* Hillsdale, NJ: Erlbaum, Chapter 19.

Class 11 (November 6) Examination of process -mediation analysis, chain of experiments

Required Background Readings:

Barron, R. M., and D. A. Kenny. "The mediator-moderator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations." Journal of Personality and Social Psychology 51, no. 6 (1986): 1173-82. – the classic

Zhao, Xinshu, John G. Lynch, Jr., and Qimei Chen (2010), "Reconsidering Baron and Kenny: Myths and Truths about Mediation Analysis," Journal of Consumer Research, 37 (August), 197-206.

Spencer, S. J., Zanna, M. P., & Fong, G. T. (2005). Establishing a causal chain: why experiments are often more effective than mediational analyses in examining psychological processes. Journal of Personality and Social Psychology, 89(6), 845.

Required Reading for Discussion in Class:

Review from earlier classes:

Raveendhran, R, Fast, N., Carnevale, P. (2020), Virtual (freedom from) reality: Evaluation apprehension and leaders' preference for communicating through avatars, Computers in Human Behavior, Volume 111, 106415

Barasch, A., Zauberman, G., & Diehl, K. (2018). How the intention to share can undermine enjoyment: Photo-taking goals and evaluation of experiences. Journal of Consumer Research, 44(6), 1220-1237.

OPTIONAL LATER READING (if interested):

MacKinnon, D., J. Cheong, and A. Pirlott, "Statistical Mediation Analysis," in H. Cooper (Ed.), APA Handbook of Research Methods in Psychology, Vol. 2 (2012).

Judd, Charles M., David A. Kenny, and Gary H. McClelland. "Estimating and testing mediation and moderation in within-subject designs." Psychological methods 6, no. 2 (2001): 115.

MacKinnon, David Peter. Introduction to statistical mediation analysis. Routledge, 2012. https://www-taylorfrancis-com.libproxy1.usc.edu/books/9780203809556

Muller, D., Judd, C. M., & Yzerbyt, V. Y. (2005). When mediation is moderated and moderation is mediated. Journal of Personality and Social Psychology, 89(6), 852-863.

Montoya, A. K., & Hayes, A. F. (2017). Two-condition within-participant statistical mediation analysis: A path-analytic framework. Psychological Methods, 22(1), 6.

Pieters, R., "Meaningful Mediation Analysis: Plausible Causal Inference and Informative Communication," Journal of Consumer Research (2017), 692-716.

Class 12 (November 13) Factor analysis, Cronbach's alpha, Cohen's Kappa, Discriminant analysis

Required Background Readings:

Pedhazur, E., Schmelkin, L. (1991). Measurement, Design, and Analysis. New York: Psychology Press, **chapter 5 (up to page 100)**
Full textbook available through USC https://doi-org.libproxy2.usc.edu/10.4324/9780203726389

Edwards, Jeffrey R., and Richard P. Bagozzi (2000). "On the nature and direction of relationships between constructs and measures." Psychological Methods 5, no.2 155.

Required Reading for Discussion in Class:

Review from Class 9:
Valsesia, F., & Diehl, K. (2022). Let me show you what I did versus what I have: Sharing experiential versus material purchases alters authenticity and liking of social media users. Journal of Consumer Research, 49(3), 430-449.

Prior to class:

Identify a paper in an area you are interested in or that you read recently that uses either factor analysis, conducts a discriminant analysis, or provides Cronbach's alpha and bring that paper to class as an example.

OPTIONAL LATER READING (if interested):

Anderson, James C., and David W. Gerbing (1988). "Structural equation modeling in practice: A review and recommended two-step approach." Psychological Bulletin 103, no. 3: 411.

Cortina, Jose M. "What is coefficient alpha? An examination of theory and applications." Journal of Applied Psychology 78, no. 1 (1993): 98-104.

Edwards, Jeffrey R. "Construct validation in organizational behavior research." In J. Greenberg (Ed.), Organizational behavior: The state of the science (2nd ed., pp. 327-371). Mahwah, NJ: Erlbaum, 2003. (2003).

Fornell, C. & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. Journal of Marketing Research, 39-50.

Shrout, P. and S. Lane, "Reliability," in H. Cooper (Ed.), APA Handbook of Research Methods in Psychology, Vol. 1 (2012).

Widaman, K. "Exploratory Factor Analysis and Confirmatory Factory Analysis," in H. Cooper (Ed.), APA Handbook of Research Methods in Psychology, Vol. 3 (2012).

Cortina, Jose M. "What is coefficient alpha? An examination of theory and applications." Journal of Applied Psychology 78, no. 1 (1993): 98-104.

For an example of formative measures/construct:
Nunes, J. C., Ordanini, A., & Giambastiani, G. (2021). The concept of authenticity: What it means to consumers. Journal of Marketing, 85(4), 1-20.

Class 13 (November 20) ANCOVA, within-participants ANOVA

Required Background Readings:

Keppel & Wickens (2004), Design and Analysis: A Researchers Handbook, (4th Edition) Upper Saddle River, NJ: Pearson/ Prentice Hall.

Chapter 15 (The Analysis of Covariance)

Chapter 17 (The Single Factor within-subject design)

Required Reading for Discussion in Class:

Henderson, M. D., Jung, H., M Baker, E., & Wakslak, C. J. (2021). Anticipated effort and morality of segregated versus aggregated volunteering. Journal of Behavioral Decision Making.

OPTIONAL LATER READING (if interested):

Birnbaum, M. H. (1999). How to show that 9> 221: Collect judgments in a between-subjects design. Psychological Methods, *4*(3), 243.

Hutchinson, J. W., Kamakura, W. A., & Lynch Jr, J. G. (2000). Unobserved heterogeneity as an alternative explanation for "reversal" effects in behavioral research. Journal of Consumer Research, *27*(3), 324-344.

Judd, C. M., Westfall, J., & Kenny, D. A. (2012). Treating stimuli as a random factor in social psychology: a new and comprehensive solution to a pervasive but largely ignored problem. Journal of Personality and Social Psychology, *103*(1), 54-69.

Kenny, D. A., & Smith, E. R. (1980). A note on the analysis of designs in which subjects receive each stimulus only once. Journal of Experimental Social Psychology, *16*(5), 497-507.

Yzerbyt, V. Y., Muller, D., & Judd, C. M. (2004). Adjusting researchers' approach to adjustment: On the use of covariates when testing interactions. *Journal of Experimental Social Psychology*, *40*(3), 424-431.

Zeelenberg, R., & Pecher, D. (2015). A method for simultaneously counterbalancing condition order and assignment of stimulus materials to conditions. Behavior Research Methods, *47*(1), 127-133.

Class 14 (November 27) Class review and wrap-up

ASSIGNMENTS

General Notes:
- Each assignment is to be done individually
- Each assignment is worth 150 points
- If you have questions about Assignment 1, 2, or 3, please email Erin
- If you have questions about Assignment 4, 5, or 6, please email Kristin

Assignment 1: Due: September 18

Assignment 2: Due: October 9

Assignment 3: Due: October 23

Assignment 4: Due: November 60

Assignment 5: Due: November 20

Assignment 6: Due: December 4

Writing up empirical findings for a journal

Below is a list of the sections that are typically included when writing up a study. Sometimes you may want to combine sections (e.g., participants and design, or procedures and measurements), but even if you don't create separate sections for this information, the information itself should be reported somewhere!

Title and description of study purpose
At the minimum it should be "Study 1" or whatever the number is. However, it is helpful to provide a title that captures what you study and/or find. Do not just use the context as a title (e.g. do not use "Bus study" but rather something more descriptive "Study 1: The Effect of Photo-taking on Enjoyment of a Real-Life Bus Tour")!
Following the title you want a paragraph that explains what the purpose of the study is. What you are doing (on an abstract level), why are you doing it, and what do you expect to find?

Participants
Here you want to describe who your participants were. Where did you recruit them from? How were they compensated? How many started the study? How many ultimately participated?
It's customary to provide gender and age as descriptive measures of your sample following the number of participants. E.g. Participants were 200 students (54% female, average age=22) who participated in return for a candy bar.

Design
This is where you describe what the experimental design was (e.g. 2 groups between subject), etc. If it's not a complicated design this section is often combined with either the participant or the procedure section.

Procedure
Here you describe what the reader needs to know how the study unfolded. The goal is to have them understand what was done and ideally being able to replicate it. Sometimes replication would require too much information if it were all included in the text of the paper. If that's the case, you should put the nitty gritty details into an Appendix or in a section called Supplemental Material.

Measures
This section describes all the measures taken - if they are important to you. This includes timing measures, choices, or other measures that are not questions answered by the respondents but that were measured unobtrusively. It is good form to include a list of <u>all</u> the measures you have taken in an Appendix / the Supplemental Materials. Then you can just state in the main text that all measures are mentioned there, but that you will only describe the ones that are pertinent to your analysis in the main text. Also standard measures (e.g. demographics) can be described very briefly.

Results
Sometimes it makes sense to start with describing your overall approach to the data analysis, for example if you use the same analysis approach for a number of different measures (e.g. "For all self-reported measures we estimated a 2 x 2 between subjects ANOVA with X1 and X2 as main effects as well as their interaction"). Or you mention the approach for the first measure and then say for subsequent measures "We estimated the same ANOVA as for Y also for Z" or something like that.
In general, you should present the analyses <u>by each measure taken</u>. So if you measured attitudes towards the brand, purchase intent, and word of mouth, you report the analysis for attitudes, separate from

purchase intent, and separate from word of mouth (even if it sounds a bit repetitive). Use sub-headers to make it clear which measure you are reporting on!!!

Think about whether any graphs are helpful to visualize your data. These will be embedded in the text and should have a title that specifies what it is (e.g., Figure 1, Table 1, etc.) as well as a descriptive statement (e.g., Figure 1 – Attitudes toward the brand as a function of coupon and advertising exposure).

Discussion

Following your analysis, you should write a discussion section for that study. Typically, 1 – 2 paragraphs. In that section you summarize what you did and what you found in a more general way.

If you have multiple studies, the discussion of a study will also set up the transition to the next study.

Supplemental Materials / Analyses

As needed.