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| **When Real Life Happens: A Practical Approach to Interpreting & Conducting Rigorous Research**Session #: 1059Day/Time: Thursday, November 17, 2016 at 1:30pm Location: CC/201B Authors: Lisa Fitton, Autumn McIlraith, Carla Wood, Emily Diehm, Jennifer Brown, & Suzanne Adlof |

**Additional Recommended Resources**

**TEXTBOOKS**

* Kazdin, A. E. (2011). *Single-case research designs: Methods for clinical and applied settings* (2nd ed.). New York, NY: Oxford University Press.
* Shadish, W. R., Cook, T. D., & Campbell, D. T. (2002). *Experimental and quasi-experimental designs for generalized causal inference*. Boston: Houghton Mifflin
* Kline, R. B. (2015). *Principles and practice of structural equation modeling* (4th ed.) New York, NY: Guilford Press.
* Raudenbush, S. W., & Bryk, A. S. (2002). *Hierarchical linear models: Applications and data analysis methods* (2nd ed.). Thousand Oaks, CA: Sage Publications.
* Thompson, B. (2004). *Exploratory and confirmatory factor analysis: Understanding concepts and applications*. Washington, DC: American Psychological Association.

**ONLINE RESOURCES**

* Logan, J. (2016). I am statistics, and so can you [Web blog]. Retrieved from http://statsineducation.tumblr.com/
* What Works Clearinghouse (2014). *Procedures and standards handbook version 3.0*. Retrieved from ies.ed.gov/ncee/wwc/Docs/referenceresources/wwc\_procedures \_v3\_0\_standards\_handbook.pdf
* Magnusson, K. Interpreting correlations: An interactive visualization. [Web page]. Retrieved from http://rpsychologist.com/d3/correlation/
* Garbin, C. Cal’s resource archive. [Web page]. Retrieved from http://psych.unl.edu/psycrs/Resource.html

**PAPERS (more technical)**

* Wood, C., McIlraith, A., & Fitton, L. (2016). State of practice for language and literacy research: A review of methods in ten relevant journals. *Contemporary Issues in Communication Science and Disorders, 43*, 195-207. doi: 1092-5171/16/4302-0195
* Ioannidis, J. (2005). Why most published research findings are false. *PLoS Medicine, 2*(8), 0696-0701. doi: 10.1371/journal.pmed.0020124
* O’Dwyer, L. M., & Parker, C. E. (2014). A primer for analyzing nested data: Multilevel modeling in SPSS using an example from a REL study (REL 2015-046). Washington, DC: U.S. Dept of Education, Inst of Edu Sci, National Center for Edu Eval and Regional Assist, Regional Edu Lab Northeast & Islands. Retrieved from http://ies.ed.gov/ncee/edlabs
* Petscher, Y. (2016). Do our means of inquiry match our intentions? *Frontiers in Psychology*, 7:1048. doi:10.3389/fpsyg.2016.01048
* Sharpe, D. (2013). Why the resistance to statistical innovations? Bridging the communication gap. *Psychological Methods, 18*(4), 572-582. doi: 10.1037/a0034177

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| **Cheat Sheet: Evaluating Research Designs and Statistical Analyses** |
|  | ***When it’s helpful*** | ***When it’s not as helpful*** | ***Things to watch out for*** |
| **Randomized Controlled Trial** | * To test an intervention that’s shown promise in smaller studies
* To generalize your results to a large, diverse population
* As the “gold standard” for causal claims about an intervention’s effectiveness
 | * When resources are limited (time, money, personnel, participants)
* When intervention cannot be ethically withheld from any participants
* To isolate individual responses to intervention
* To study the influence of factors you cannot change
 | * Was true random assignment used?
* Are there issues with the control group not remaining a true control?
* Were there enough participants for randomization to be effective?
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| **Single-Case Design** | * To test new intervention ideas
* With low-incidence populations
* When resources are limited
 | * To generalize your results to a large, diverse population
* To evaluate more established interventions
 | * Is there a reasonable baseline period? (e.g., ~ 5 time points)
* Did the baseline period convince you the participant(s) exhibited stable performance prior to intervention?
* Is there replication of the observed effect? (3 or more instances)
 |
| **Quasi-Experimental Design** | * To study the influence of factors you cannot change (e.g., gender, SES, (dis)ability status
* When it would be unethical to withhold treatment from a control group
 | * To make strong causal claims
* To generalize your results to a large, diverse population
 | * How strong is the counterfactual (if there is one)?
* Are there any signs of experimenter bias?
* Was a pretest used to examine pre-existing differences between groups?
* Over-reaching on the conclusions?
 |
|  | ***When it’s helpful*** | ***When it’s not as helpful*** | ***Things to watch out for*** |
| **Structural Equation Modeling** | * To study many interrelated factors at the same time
* To determine the “most important” predictors
* To get a better view of the big picture
 | * With smaller sample sizes
* When few variables are available
 | * Be wary of claims about directionality of relationships: not a sure thing
* How is the model fit?
* Are there individual sampling issues?
* Is there possible masking of real effects?
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| **Hierarchical Linear Modeling** | * When data have a nested structure (e.g., students nested within schools; or many time points nested within person)
* With larger sample sizes
 | * With smaller sample sizes
* With fewer than 10 higher-level units (e.g., schools)
 | * Does the unit of assignment match the unit of analysis?
* Are the assumptions met?
* Has missing data been handled properly, and reported?
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