Research Methods Study Guide

You need to understand the terms AND be able to recognize them when given examples. You should also be familiar with the advantages and disadvantages of the various experimental designs.

- Use of theories in research; properties of a good theory
- Basic vs applied research
- Quantitative vs qualitative research
- Correlational vs experimental research
- Independent and dependent variables
- Levels of independent variable
- Control factors/variables
- Random variables
- Randomization with and without constraints
- Experimental validity: internal vs external validity
- Threats to internal validity
- Regression to the mean
- Operational definitions
- Types of independent variables: manipulated vs subject variables
- Types of dependent variables
- Reliability and validity
- Measurement of reliability: test-retest, inter-rater, split-half
- Types of validity: face, discriminant, concurrent, content, predictive
- Within-subjects vs between-subjects designs
- Counterbalancing: complete, partial
- Balanced Latin Square counterbalancing
- Asymmetrical transfer and effectiveness of counterbalancing
- Within-subjects, matched groups, and randomized groups designs
- Experimental hypothesis
- Null hypothesis
- Decision rule for interpreting data
- Two-level vs multi-level experiments
- Empty control vs placebo control groups
- Floor and ceiling effects
- Types of factorial designs
- Main effects vs interactions
- Multivariate designs
- Converging series/operations
- Meta-analysis
- Experimenter bias (and ways to minimize it)
- Blind and double-blind procedures
- Participant bias
- Hawthorne Effect
- Demand Characteristics (understand difference between Hawthorne Effect and demand characteristics)
- Ways to control or detect participant bias
- Manipulation checks
- Institutional Review Boards
- Ethical issues for human and animal participants
- Reasons to do research with animals
- Quasi-experimental designs
• Non-equivalent groups
• Non-equivalent control group design with pretest and posttest
• How matching in nonequivalent control group design can enhance statistical regression
• Variations on nonequivalent control group design (proxy pretest, separate pre- and posttest samples)
• Interrupted Time Series Designs and variations (with controls, with removed treatments)
• Threats to internal validity in Interrupted Time Series Designs
• Single-subject designs: baseline and intervention phases
• Survey research (types of samples, issues in constructing questionnaires and how questions are interpreted, guidelines for writing questions)
• Advantages and disadvantages of phone, mail, face-to-face, and internet surveys
• Factors to consider in overall evaluation of research study
• How to spot pseudoscience and failures in thinking to avoid when evaluating “scientific” claims