

Search Topics

Overview	
Bookmarks	
Course Schedule	1
Table of Contents	5
Getting Started	2
Turnitin Assignment: Student Pre-Check	1
Section 1: Quantitative Methods Overview and Designs	✓
Section 2: Quantitative Research Processes	✓
Section 3: Survey and Experimental Research	1
Week 5	✓
Week 6	✓
Week 7	1
Section 4: Signature Assignment	1

Week 7

Print

Experimental Research

The final type of research you will discuss is experimental research. Experimentation is conducted in order to test a causal hypothesis. That is, you want to determine if an independent variable (X) caused a dependent variable (Y). In order to do so, you have to show that X precedes Y, and whether the two variables are associated, and you need to eliminate other possible causes of the change in Y.

In a true experiment, a researcher manipulates the *independent* variable and measures its impact on the *dependent* variable while at the same time controlling for all other variables that may have influenced the dependent variable. Their other variables are referred to as *extraneous* or potentially confounding variables (e.g., if you wanted to determine if gender had an influence on the perceived trustworthiness of a spokesperson in an advertisement). Using this example, a researcher could create two mock ads that are designed to be exactly the same except for the gender of the spokesperson.

When designing an experiment, the researcher wants to determine: (1) whether the independent variable is the sole cause of any change in the dependent variable; and (2) if the results of the experiment can be generalized to other populations, settings, times, etc. These are referred to as internal and external validity.

Internal validity is the degree to which the research may correctly conclude that the independent variable is responsible for changes to the dependent variable. In some situations, there may be explanations for changes to the dependent variable other than the independent variable. These alternative explanations are known as threats to internal validity. These are some common threats to internal validity.

Plausible Threat Internal Validity	Explanation
History	Events occurring immediately prior to or simultaneously with the research, other than the experimental treatments, hypothesized to influence the dependent variable.
Maturation	During the study, physiological or psychological changes that naturally occur within participants may influence the dependent variable.
Testing	Exposure to a pretest or intervening assessment that influences performance on a posttest.
Instrumentation	Testing instruments or conditions are inconsistent; or pretest and posttest are not equivalent, creating an illusory change in performance.

Statistical Regression	Scores of participants that are very high or very low tend to regress towards the mean during retesting.
Selection	Systematic differences that exist naturally in participants' characteristics between treatment groups.
Experimental Mortality	Subject attrition may bias the results.
Diffusion of Treatments	Implementation of one condition influences participants in another condition.
Subject Predisposition	Participants often respond in ways that they think are appropriate or expected by the researcher. [cooperative-subject; uncooperative participants; evaluation apprehension]

External validity is the degree to which the research may correctly conclude that the study findings may be generalized beyond the sample to and across the population of interest. Limitations to generalizability of research results to the population of interest are known as threats to external validity. These are some common threats to external validity.

Plausible Threat External Validity	Explanation
Sampling bias	Sample selected by the researcher does not represent the theoretical population (population of interest).

Interaction of testing and treatment	Results obtained under repeated exposure or testing may not generalize to situations/environments that do not involve repeated exposure or testing.
Interaction of selection and treatment.	Factors that affect availability of participants OR participants willingness to volunteer may not generalize to participants not available for participant OR those not willing to volunteer.
Interaction of setting and treatment.	Unique characteristics of the setting in which results are obtained, or data collected, may restrict generalizability of results to other settings. Setting characteristics may also include interaction of the researcher, location, timeframe.
Reactive arrangements (or Hawthorne effect)	Participants may behave differently when they are being observed, tested, or are participating in a research study.
Multiple-exposure interference	Participants exposed to multiple treatments may alter generalizability to groups not exposed to multiple treatments.

Note that there is often a tradeoff between internal and external validity and the experimental setting (a lab vs. field experiment). A laboratory experiment is an artificial setting that allows the researcher better control over extraneous/potentially confounding variables. However, the artificiality of a lab experiment tends to lessen the external validity since you want to be able to generalize to a more realistic setting. Essentially laboratory vs. field experiments represents opposite ends of a continuum having to do with the artificiality of the setting.

Be sure to review this week's resources carefully. You are expected to apply the information from these resources when you prepare your assignments.

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Week 7 - Assignment: Create an Instructor's Presentation to Teach Students about Internal and External Validity

Assignment



Due December 11 at 11:59 PM

Create an instructor's narrated PowerPoint presentation to teach students about internal and external validity. The presentation is to be narrated and usable in a teaching environment. Include the following:

- Overview introduction on why researchers should be aware of internal and external validity.
- Internal Validity
 1. Define internal validity.
 2. Identify four common threats to internal validity
 3. Provide an example for each of the four selected threats to internal validity using your intended dissertation research or quantitative example for this course.
 4. Discuss two plausible research strategies that may be used to mitigate two of the selected threats to internal validity.
- External Validity
 1. Define external validity.
 2. Identify two common threats to external validity.
 3. Provide an example for each of the two selected threats to external validity using your intended dissertation research or quantitative example from this course.
 4. Discuss one plausible research strategy that may be used to mitigate one of the selected threats to external validity.
- Provide a presentation conclusion.

Length: 8 to 10 slide PowerPoint narrated presentation. Speaker notes (minimum 200 words per slide)

Your presentation should demonstrate thoughtful consideration of the ideas and concepts presented in the course and provide new thoughts and insights relating directly to this topic. Your response should reflect scholarly writing and current APA standards. Be sure to adhere to Northcentral University's Academic Integrity Policy.

Upload your document and click the *Submit to Dropbox* button.