

*Nonexperimental Research Designs  
and Survey Research*

Katie Rommel-Esham  
Education 504

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*Research Design*

- ❖ Research design deals with the ways in which data are gathered from subjects

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*Relationships in  
Nonexperimental Research*

- ❖ All quantitative research that is not simply descriptive is interested in examining relationships
- ❖ A relationship or association is found when one variable varies systematically, either directly or indirectly with another

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*The Importance of Relationships*

- ❖ They allow us to make preliminary identification of possible causes of educational outcomes
- ❖ They help identify things that need further investigation
- ❖ They allow for prediction from one variable to another

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*Descriptive Research*

- ❖ Concerned with the current or past status of something
- ❖ Describes achievement, attitudes, behaviors, or other characteristics of a group of subjects
- ❖ Does not involve manipulation of independent variables

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*Uses of Descriptive Research*

- ❖ Provide data for initial investigation of an area of study or phenomenon
- ❖ Examples of descriptive research questions include
  - *How much do college students exercise?*
  - *What do teachers think about merit pay?*
  - *How do students spend their time during independent study?*

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*Things to Consider When  
Evaluating Descriptive Studies*

- ❖ When conducting descriptive studies, relationship conclusions are not warranted!
  
- ❖ Pay close attention to the nature of the subjects and the instruments (volunteers, circumstances under which data were collected, etc.)

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*Comparative Studies*

- ❖ Examines the differences between two or more groups on one variable
  
- ❖ For example,  
*Is there a difference between second- and third-graders' scores on a measure of self concept?*

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*Comparative Studies*

- ❖ Comparisons are based on *descriptive data*
  
- ❖ **Existence of a relationship does not imply causation** -- we can only say that a difference or relationship exists

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## *Correlational Research*

*Bivariate Correlational Studies*  
*Prediction Studies*  
*Multiple Regression Prediction Studies*

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## *Bivariate Correlational Studies*

- ❖ In a *bivariate* study, researchers obtain scores from two variables for each subject, then use them to calculate a correlation coefficient
- ❖ The term *bivariate* implies that the two variables are correlated (variables are selected because they are believed to be related)
- ❖ Subjects should be chosen to represent a wide range of performance on the variables, or the discovery of a relationship is unlikely

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## *Examples of Bivariate Correlational Studies*

- ❖ Children of wealthier (variable #1), better educated (variable #2) parents earn higher salaries as adults.
- ❖ The weight of a three-year old is correlated to the child's birth weight (variable #1) and the mother's weight (variable #2) at the time of the child's birth.

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*Prediction Studies*

- ❖ Use correlation coefficients to show how one variable (the predictor variable) predicts another (the criterion variable)

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*Example of a Prediction Study*

- ❖ Which high school applicants should be admitted to college?
- ❖ For example, assume that high school GPA (predictor) is a good predictor of college GPA (criterion)
- ❖ The predictor variable is determined before the criterion variable, and the data span a length of time (4 years of high school)

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*Multiple Regression Prediction Studies*

- ❖ Suppose, in fact, that high school GPA is not the sole predictor of college GPA (which we believe to be the case)
- ❖ What might be other good predictors?
- ❖ All of these variables can contribute to the overall prediction in an equation that adds together the predictive power of each identified variable

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### *Things to Keep in Mind*

- ❖ *Correlation does not imply causation*
- ❖ Sample should be chosen carefully if data are to be extrapolated back to the population
- ❖ *Practical* significance and *statistical* significance are not the same animal
- ❖ Acceptable levels of correlation are situation specific
- ❖ To increase practical confidence levels, all results should be replicated
- ❖ All procedures should be clearly delineated

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### *Causal Comparative Studies: Ex Post Facto Research*

- ❖ *Nonexperimental* designs that are used to investigate causal relationships
- ❖ They examine whether one or more *pre-existing conditions* could possibly have caused subsequent differences in groups of subjects
- ❖ Researchers attempt to discover whether differences between groups have resulted in an observed difference in the independent variable

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### *Examples of Ex Post Facto Studies*

- ❖ *What is the effect of day care on the social skills of children?*
  
- ❖ *What is the relationship between participation in extracurricular activities and self concept?*

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*Characteristics of Ex Post Facto Studies*

- ❖ There may be both “treatment” and “control” groups, however these will be existing, not assigned by the researcher
- ❖ There is no manipulation of conditions

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*McMillan’s Tips...*

- ❖ Causal comparative studies should be used to investigate relationships when an experiment is not possible
- ❖ The causal condition must have occurred *in the past*
- ❖ Potential extraneous variables (PRH) should be identified and noted
- ❖ Differences in groups should be controlled
- ❖ Causal relationships should be noted with caution!

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*Survey Research*

- Longitudinal Surveys
- Cross-Sectional Surveys

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### *Characteristics of Survey Research*

- ❖ In survey research, the researcher selects a sample of respondents and administers a questionnaire or conducts interviews to gather data, which are then used to describe the population
- ❖ Surveys are used to learn about attitudes, beliefs, opinions, behaviors, to name a few
- ❖ Surveys are often used because researchers can gather accurate information about a large number of people using a small sample
- ❖ Thus we have both surveys as a *research tool* and survey research as a *research design*.

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### *Examples of Survey Research Topics*

- ❖ Descriptive Studies
  - *What is the average length of time teachers use to prepare lessons?*
- ❖ Relationship Studies
  - *Is there a relationship between teacher attitudes toward discipline and student satisfaction with the class?*
- ❖ Explanatory Studies
  - *Why are students in one school achieving better than similar students in another school?*

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### *Advantages of Survey Research*

- ❖ Versatility
- ❖ Efficiency
- ❖ Generalizability
- ❖ Cost effectiveness
- ❖ Small samples provide for reliable extrapolation of results

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### *Longitudinal Surveys*

- ❖ Studies in which the same group of subjects are studied over time
- ❖ *Trend studies* use the *same population* across time but use *different samples* from that population each time
- ❖ *Cohort studies* examine a specific group (*same population*) over time
- ❖ *Panel studies* are cohort studies that use the *same sample* each time

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### *Cross-Sectional Surveys*

- ❖ Attempt to simulate longitudinal data in a shorter time frame
- ❖ Data are gathered from *multiple samples of the same population simultaneously*
- ❖ May be used to study a phenomenon at one time or to gather data from multiple groups at the same time

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### *A Note on Surveys...*

- ❖ Need to know, in advance, how the data will be used rather than “fishing” for whatever’s out there
- ❖ Data collection methods may vary but they must be standardized
- ❖ Instructions should be clear
- ❖ Both the instructions and survey should be pilot tested
- ❖ Because a typical response rate to a mailed survey is only 40%-60%, follow ups should be conducted
- ❖ Nonrespondents may introduce bias

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