Quantitative Method: Survey Design

CS 7123, Spring 2025

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used/adopted from the book Research Design: Qualitative, Quantitative, and Mixed Methods Approaches, by John W. Creswell and J. David Creswell.

Quantitative Methods

- Survey Design
- Controlled Experiments
- Quasi-Experiments
- ….

Survey Design

- A quantitative or numeric description of trends, attitudes, or opinions of a population by studying a sample of that population.

- Follows a standard format

Survey Design: Generic Guide

Table 8.1 A Checklist of Questions for Designing a Survey Method

_____	Is the purpose of a survey design stated?
_____	Are the reasons for choosing the design mentioned?
_____	Is the nature of the survey (cross-sectional vs. longitudinal) identified?
_____	Is the population and its size mentioned?
_____	Will the population be stratified? If so, how?
_____	How many people will be in the sample? On what basis was this size chosen?
_____	What will be the procedure for sampling these individuals (e.g., random, nonrandom)?
_____	What instrument will be used in the survey? Who developed the instrument?
_____	What are the content areas addressed in the survey? The scales?
_____	What procedure will be used to pilot or field-test the survey?
_____	What is the timeline for administering the survey?
_____	What are the variables in the study?
_____	How do these variables cross-reference with the research questions and items on the survey?
	What specific steps will be taken in data analysis to do the following:
(a)_____	Analyze returns?
(b)_____	Check for response bias?
(c)_____	Conduct a descriptive analysis?
(d)_____	Collapse items into scales?
(e)_____	Check for reliability of scales?
(f)_____	Run inferential statistics to answer the research questions or assess practical implications of the results?
_____	How will the results be interpreted?

Source: Research Design: Qualitative, Quantitative, and Mixed Methods Approaches, by John W. Creswell and J. David Creswell

Survey Design: Intro

- Identify the purpose of survey research
- Why a survey is the preferred type of data collection procedure for the study
  - consider the advantages of survey designs, such as the economy of the design and the rapid turnaround in data collection.
  - Discuss the advantage of identifying attributes of a large population from a small group of individuals
- Cross-sectional vs. Longitudinal
- Specify the form of data collection
  - mail, the Internet, personal interviews, etc.
  - rationale for the procedure, based on its strengths and weaknesses: e.g., costs, data availability, etc.

Survey Design: Population and Sample

- Identify the population and its size
- Single-stage vs. multistage sampling design
- Selection process for individuals
- whether the study will involve stratification of the population

Survey Design: Population and Sample

(Bean & Creswell, 1980, pp. 321–322)

The site of this study was a small (enrollment 1,000), religious, coeducational, liberal arts college in a Midwestern city with a population of 175,000 people. *[Authors identified the research site and population.]*

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Survey Design: Instrument

- Name the survey instrument used to collect data
  - Establish validity and reliability
- When one modifies an instrument or combines instruments in a study, the original validity and reliability may not hold for the new instrument
- Plan for pilot testing or field-testing the survey and rationale
  - Important to establish the content validity and potential instrument revisions
- For a mailed survey, identify steps for administering the survey and for following up to ensure a high response rate
  - (Salant and Dillman, 1994) four-phase administration process
  - (Dillman, 2007) four-phase administration process

Survey Design: Instrument

(Bean & Creswell, 1980, pp. 321–322)

Data were collected by means of a questionnaire containing 116 items. The majority of these were Likert-like items based on a scale from "a very small extent" to "a very great extent." Other questions asked for factual information, such as ACT scores, high school grades, and parents' educational level. All information used in this analysis was derived from questionnaire data. This questionnaire had been developed and tested at three other institutions before its use at this college. *[Authors discussed the instrument.]*

Concurrent and convergent validity (Campbell & Fiske, 1959) of these measures was established through factor analysis, and was found to be at an adequate level. Reliability of the factors was established through the coefficient alpha. The constructs were represented by 25 measures—multiple items combined on the basis of factor analysis to make indices—and 27 measures were single item indicators. *[Validity and reliability were addressed.]*

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Survey Design: Variables in Study

Table 8.2 Variables, Research Questions, and Items on a Survey

Variable Name	Research Question	Item on Survey
Independent Variable 1: Prior publications	Descriptive research Question 1: How many publications did the faculty member produce prior to receipt of the doctorate?	See Questions 11, 12, 13, 14, and 15: publication counts for journal articles, books, conference papers, book chapters published before receiving the doctorate
Dependent Variable 1: Grants funded	Descriptive research Question 2: How many grants has the faculty member received in the past 3 years?	See Questions 16, 17, and 18: grants from foundations, federal grants, state grants
Control Variable 1: Tenure status	Descriptive research Question 3: Is the faculty member tenured?	See Question 19: tenured (yes/no)
Relating the Independent Variable 1: Prior publications to the Dependent Variable: Grants funded	Inferential Question 4: Does prior productivity influence the number of grants received?	See Questions 11,12,13,14,15 to Questions 16, 17, 18

Source: Research Design: Qualitative, Quantitative, and Mixed Methods Approaches, by John W. Creswell and J. David Creswell

Survey Design: Data Analysis & Interpretation

1. Number of participants who returned or not returned the survey
2. Methods to determine response bias
3. Descriptive analysis of data
4. If plan to develop a scale, identify the procedure to accomplish this
5. Identify the statistics/methods to test the research question or hypothesis
6. Present and interpret the results
    - How the results answer the research question/hypothesis
    - Discuss the research implications

Survey Design: Data Analysis & Interpretation

(Bean & Creswell, 1980, pp. 321–322)

The dropout rate the previous year was 25%. Dropout rates tend to be highest among freshmen and sophomores, so an attempt was made to reach as many freshmen and sophomores as possible by distribution of the questionnaire through classes. Research on attrition indicates that males and females drop out of college for different reasons (Bean, 1978, in press; Spady, 1971). Therefore, only women were analyzed in this study.

During April 1979, 169 women returned questionnaires. A homogeneous sample of 135 women who were 25 years old or younger, unmarried, full-time U.S. citizens, and Caucasian was selected for this analysis to exclude some possible confounding variables (Kerlinger, 1973).

Of these women, 71 were freshmen, 55 were sophomores, and 9 were juniors. Of the students, 95% were between the ages of 18 and 21. This sample is biased toward higher-ability students as indicated by scores on the ACT test. *[Authors presented descriptive information about the sample.]*

Multiple regression and path analysis (Heise, 1969; Kerlinger & Pedhazur, 1973) were used to analyze the data. In the causal model …, intent to leave was regressed on all variables which preceded it in the causal sequence. Intervening variables significantly related to intent to leave were then regressed on organizational variables, personal variables, environmental variables, and background variables. *[Data analysis steps were presented.]*

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