



## Research Design

*Note to students:* This chapter includes questions and exercises relating to the textbook introduction to Section II (Research Methods), indicated by SI (Section Introduction).

### Q & A

#### 1. **What is research methodology? (SI)**

Research methodology is the science of methods for investigating phenomena. Research methods are used in almost every social science discipline and can be applied to many different kinds of problems, including those found in public and nonprofit management and analysis.

#### 2. **What is basic research? What is applied research? (SI)**

Basic research is a research activity whose purpose is to develop new knowledge about phenomena such as problems, events, programs or policies, and their relationships. Applied research is a research activity whose purpose is to develop knowledge for addressing practical problems.

#### 3. **What are quantitative research methods? What are qualitative research methods? (SI)**

Quantitative research methods involve the collection of data that can be analyzed using statistical methods. The purpose of quantitative research is to quantify the magnitude of phenomena, to provide statistical evidence about factors affecting these phenomena, and to quantify the impacts of programs and policies. Qualitative research methods involve the collection and analysis of words, symbols, or artifacts that are largely nonstatistical in nature. Typically, the purpose of qualitative research is to identify and describe new phenomena and their relationships.

#### 4. **What are variables?**

Variables are empirically observable phenomena that vary.

#### 5. **What are attributes?**

Attributes are the specific characteristics of a variable, that is, the specific ways in which a variable can vary. All variables have attributes. For example, the variable “gender” has two attributes: male and female.

#### 6. **How is descriptive analysis different from the study of relationships?**

Descriptive analysis provides information about (the level of) individual variables, whereas the study of relationships provides information about the relationships among variables.

**7. Define the terms independent variable and dependent variable.**

All causal relationships have independent and dependent variables. The dependent variable is the variable that is affected (caused) by one or more independent variables. Independent variables are variables that cause an effect on other variables but are not themselves shaped by other variables.

**8. What is a causal relationship, and how is it different from an association?**

Most studies describe relationships among variables. When relationships are causal, one variable is said to be the cause of another. When variables are only associated with each other, no effort is made to identify patterns of causation.

**9. What is required for establishing a claim of causality?**

To establish causality, there must be both empirical correlation and a plausible theory that explains how these variables are causally related.

**10. What is a hypothesis?**

A hypothesis is a relationship that has not yet been tested empirically.

**11. What six steps are involved in program evaluation?**

The six steps are as follows: (1) defining program goals and activities, (2) identifying which key relationships will be studied, (3) determining what type of research design will be used, (4) defining and measuring study concepts, (5) collecting and analyzing program data, and (6) presenting study findings.

**12. What are rival hypotheses? What are control variables?**

Rival hypotheses state threats to the credibility of study conclusions. Control variables are variables used in empirical research to evaluate rival hypotheses.

**13. Explain the role of statistics in determining the impact of rival hypotheses (or control variables) on program outcomes.**

The impact of rival hypotheses can seldom be ascertained through research design alone. Statistics, then, are used to examine these impacts. (Statistics are also used for other purposes, explained in subsequent chapters of *Essential Statistics for Public Managers and Policy Analysts*.)

**14. How are quasi-experimental designs different from classic, randomized experiments?**

In a classic experimental design, participants are randomly assigned to either a control or an experimental group. The *only* systematic difference between the groups is that study group participants receive an intervention (called a stimulus, such as a therapy, subsidy, or training). Any outcome differences between these two groups are then attributed to the systematic difference—the treatment. Such testing conditions are seldom possible in public management and policy. Quasi-experimental designs are imperfect research designs that may lack baselines, comparison groups, or randomization, which are present in classic, randomized experiments.

**15. What are threats to external validity?**

Threats to external validity are those that jeopardize the generalizability of study conclusions to other situations. These threats often concern unique features of the study population or research design.

**16. What are threats to internal validity?**

Threats to internal validity are those that jeopardize study conclusions about whether an intervention in fact caused a difference in the study population. These threats often question the logic of study conclusions.

### CRITICAL THINKING

1. Give examples of basic and applied research questions that might be raised in the context of (1) a program to reduce adult illiteracy and (2) a program that fights international terrorism. (SI)

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2. Why are both quantitative and qualitative methods indispensable in addressing questions of basic and applied research? (SI)

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3. Give some examples of variables. Why are variables key to research?

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4. A program aims to reduce adult illiteracy by providing reading sessions during evening hours. Identify the dependent and independent variables.

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5. A study examines the impact of gender and drug use on school performance and political orientations. Identify the dependent and independent variables.

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6. It is said that in Sweden an empirical association exists between the presence of storks and the incidence of new babies. Explain what is necessary to establish a claim of causation. Do storks really bring babies?

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7. A study examines the relationship between race and crime. Is this a causal relationship or an association? Explain.

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8. Apply the following statement to program evaluation: "Research begins with asking questions." Think about a program that you know about as a basis for answering this question.

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9. The developers of the adult literacy program mentioned in question 4 claim that the program is effective. By what measures might this effectiveness be demonstrated?

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10. What might be some rival hypotheses regarding the effectiveness of this adult literacy program?

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11. Discuss an experimental research design for testing the effectiveness of an anger management program. Then apply the three quasi-experimental designs mentioned in Box 2.2 in the text.

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**APPLICATION EXERCISES**

1. Give examples of basic and applied research questions in your area of interest. (SI)

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2. Give examples of quantitative and qualitative research methods in your area of interest. (SI)

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3. Consider the following variables: the number of immigrants, attitudes toward abortion, and environmental pollution. What might be some attributes of each of the variables?

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4. You have been asked to develop a neighborhood crime control program. Thinking ahead, you develop a strategy for evaluating the program in subsequent months and years. Define the program and identify dependent and independent variables that can be used to evaluate it.

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5. Identify a problem in your area of interest. Identify the dependent and one or more independent variables affecting this problem.

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6. Consider a program or policy in your area of interest. How do the specific issues raised in the text regarding program evaluation apply to your program or policy? For instance, give some examples of how difficult it can be to document program outcomes.

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7. Discuss how you can apply the six steps of program evaluation to a specific program in your area of interest.

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8. Find an article that discusses a specific program evaluation and identify in it each of the six steps of program evaluation.

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9. Identify some rival hypotheses (control variables) that might affect conclusions about the effectiveness of an adult literacy program. Then, discuss how an experimental research design and several quasi-experimental designs might be helpful for determining the effectiveness of the program.

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10. Define the objectives of a job training program, and then identify some rival hypotheses regarding possible outcomes. Explain how baselines and comparison groups might be used.

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### FURTHER READING

The all-time, best-selling, easy-to-read general textbook on research methods in social science (general) is Earl Babbie, *The Practice of Social Research*, 14th ed. or later (Belmont, Calif.: Wadsworth, 2016). A book with a focus on statistics in public administration is Maureen Berner, *Statistics for Public Administration: Practical Uses for Better Decision Making*, 2nd ed. (Washington, D.C.: ICMA, 2013). A variety of books on program evaluation may be found readily online, and we encourage readers to choose one. An example is David Royse, Bruce A. Thyer, and Deborah K. Padgett, *Program Evaluation: An Introduction to an Evidence-Based Approach*, 6th ed. (Boston, Mass.: Cengage, 2015). Another source with applications in public administration is Kathryn E. Newcomer, Harry P. Hatry, and Joseph S. Wholey (Eds.), *Handbook of Practical Program Evaluation*, 4th ed. (San Francisco: Jossey-Bass, 2015). A classic book on program evaluation is Peter Rossi, Mark W. Lipsey, and Howard E. Freeman, *Evaluation: A Systematic Approach*, 7th ed. or later (Thousand Oaks, Calif.: Sage, 2003), but that book is now getting dated.

Research methods are used widely in scholarly research, of course. The *Journal of Policy Analysis and Management* publishes many articles that evaluate specific programs and policies. Some of these articles, though not all, are grounded in economic thought. Policy journals are doing well these days, and many fields have their own policy journals, such as *Education Policy*, *Transport Policy*, *Space Policy*, *Environmental Policy and Governance*, *Research Policy*, and so on. Also, most empirical articles in the leading journals in public administration, political science, and nonprofit management use the terminology of independent, dependent, and control variables discussed in this chapter. You should have no problem picking up any leading scholarly journal in your field and finding these terms used. A few studies in public and nonprofit management and policy analysis use comparison groups and quasi-experimental designs, but most rely on statistical techniques to account for control variables. These techniques are discussed later in the textbook.