Chapter 3

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The Use of Theory One component of reviewing the literature is to determine what theories might be used to explore the questions in a scholarly study.

 In quantitative research, researchers often test hypotheses stemming from theories. In a quantitative dissertation, an entire section of a research proposal might be devoted to presenting the broader theory guiding the study hypotheses. In qualitative research, the use of theory is much more varied. The inquirer may generate a theory as the final outcome of a study and place it at the end of a project, such as in grounded theory. In other qualitative studies, it comes at the beginning and provides a lens that shapes what is looked at and the questions asked, such as in ethnographies or in participatory–social justice research. In mixed methods research, researchers may both test theories and generate them. Moreover, mixed methods research may contain a theoretical framework within which both quantitative and qualitative data are collected. These frameworks can be drawn from feminist, racial, class, or other perspectives and they flow through different parts of a mixed methods study.

Theories can be used in quantitative, qualitative, and mixed methods studies. We begin this chapter by focusing on theory use in a quantitative study. We review a definition of a theory, the use of variables in a quantitative study, the placement of theory, and the alternative forms it might assume in a written plan. Procedures in identifying a theory are next presented, followed by a script of a theoretical perspective section of a quantitative research proposal. Then the discussion moves to the use of theory in a qualitative study. Qualitative inquirers use different terms for theories, such as patterns, theoretical lens, or naturalistic generalizations, to describe the broader explanations used or developed in their studies. Examples in this chapter illustrate the alternatives available to qualitative researchers. Finally, the chapter turns to the use of theories in mixed methods research and the use of social science and participatory–social justice theories in such research.

 Quantitative Theory Use

Testing Causal Claims in Quantitative Research Prior to discussing variables, their types, and their use in quantitative research, we first need to visit the concept of causality in quantitative research. A leading writer in this area has been Blalock (1991). Causality means that we would expect variable X to cause variable Y. As a simple example, does drinking one glass of red wine daily cause you to have a reduced risk for a heart attack? In this case, daily wine consumption is the X variable, and a heart attack event would be the Y variable. One critically important consideration in evaluating causal claims (like this red wine consumption example) is whether an unmeasured third variable (Z) may be the cause of the outcome you are measuring. For example, there may be a Z variable (such as daily exercise) that is positively associated with both moderate red wine consumption and with heart attacks, and may be the causal factor for reducing heart attacks (not moderate red wine consumption!). In quantitative research this third variable is called a confounding variable, and can become quite problematic for establishing causality if it is not measured in a study. We would not want to mistakenly infer that moderate red wine consumption promotes heart health if it plays no causal role in reducing heart attacks. If you aim to test a causal claim about the relationship between two or more variables in your quantitative study, your best choice is to conduct a true experiment, which will provide more control over potential confounding variables (see Chapter 8). If you are less interested in testing a causal claim or if you cannot conduct an experiment, then survey methods can be used to test claims about hypothesized associations between variables (see Chapter 8)—for example, you may be interested in first establishing if a positive association exists between moderate daily red wine consumption and clinical markers of heart disease risk in a correlation analysis. Indeed, a number of epidemiological health science studies highlight a positive association between moderate daily red wine consumption (1–2 drinks per day) and a 20% reduction in risk for heart disease (e.g., Szmitko & Verma, 2005).association exists between moderate daily red wine consumption and clinical markers of heart disease risk in a correlation analysis. Indeed, a number of epidemiological health science studies highlight a positive association between moderate daily red wine consumption (1–2 drinks per day) and a 20% reduction in risk for heart disease (e.g., Szmitko & Verma, 2005).

Variables in Quantitative

Research Before discussing quantitative theories, it is important to understand variables and the types that are used in forming theories. A variable refers to a characteristic or attribute of an individual or an organization that can be measured or observed and that varies among the people or organization being studied. Variables often measured in studies include gender; age; socioeconomic status (SES); and attitudes or behaviors such as racism, social control, political power, or leadership. Several texts provide detailed discussions about the types of variables one can use and their scales of measurement (e.g., Isaac & Michael, 1981; Keppel, 1991; Kerlinger, 1979; Thompson, 2006; Thorndike, 1997). Variables are distinguished by two characteristics: (a) temporal order and (b) their measurement (or observation).

Temporal order means that one variable precedes another in time. Because of this time ordering, it is said that one variable affects or predicts another variable. Temporal order also means that quantitative researchers think about variables in an order from “left to right” (Punch, 2014) and order the variables in purpose statements, research questions, and visual models into left-to-right, cause-and-effect type presentations. Types of variables include the following:

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Independent variables are those that influence, or affect outcomes in experimental studies. They are described as “independent” because they are variables that are manipulated in an experiment and thus independent of all other influences. Using the earlier example, you may decide to run an eight-week experimental study where you ask some participants to drink one glass of red wine daily (red wine group), whereas other participants in a comparison group are instructed to maintain their normal consumption patterns (control group). You are systematically manipulating red wine consumption, and thus moderate red wine consumption is an independent variable in this study. Independent variables are also commonly referred to as treatment or manipulated variables in experimental studies. Dependent variables are those that depend on the independent variables; they are the outcomes or results of the influence of the independent variables. We recommend that one aim to measure multiple dependent measures in experimental studies, and in the red wine example a researcher might consider measuring dependent variables such as heart attack incidence, strokes, and/or the amount of arterial atherosclerotic plaque formations. Predictor variables (also called antecedent variables) are variables that are used to predict an outcome of interest in survey method studies. Predictor variables are similar to independent variables in that they are hypothesized to affect outcomes in a study, but dissimilar because the researcher is not able to systematically manipulate a predictor variable. It may not be possible or feasible to assign individuals to a red wine consumption or control group (as an independent variable) but it may be possible to measure naturally occurring red wine consumption in a community sample as a predictor variable. Outcome variables (also called criterion or response variables) are variables that are considered outcomes or results of predictor variables in survey method studies. They share the same properties as dependent variables (described above). Other types of variables provide a supporting cast in quantitative research, and we recommend that you make efforts to identify and measure these variables in your quantitative research study: Intervening or mediating variables(Intervening or mediating variables) stand between the independent and dependent variables, and they transmit the effect of an independent variable on a dependent variable (for a review, see MacKinnon, Fairchild, & Fritz, 2007). A mediating variable can be tested using different kinds of statistical mediation analyses (see MacKinnon et al., 2007, for some examples), and provides a quantitative assessment of how the independent variable is exerting its effects on the dependent variable (or in the case of survey method studies how a predictor variable may be exerting its effects on an outcome variable of interest). One leading idea is that the polyphenol compounds in red wine are what is driving the health benefits of moderate red wine consumption (e.g., Szmitko & Verma, 2005), so one possibility could be to measure the amount of polyphenols occurring in a red wine consumption study as a mediating variable. Researchers use statistical procedures (e.g., analysis of covariance [ANCOVA]) to control for these variables. Moderating variables are predictor variables that affect the direction and/or the strength of the relationship between independent and dependent variables, or between predictor and outcome variables (Thompson, 2006). These variables act on or intersect with the independent variables, and then together in combination with the independent variables influence the dependent variables. Moderating variables are powerful in that they can identify potential boundary conditions (e.g., participant gender; are the effects of moderate red wine consumption on heart attacks much larger for males compared to females?) of the effect of interest.

In a quantitative research study, variables are related to answer a research question, and while we have focused our discussion on the simple red wine–heart disease relationship, these variables and links can be extended to a multitude of other phenomena that we care to understand (e.g., “How does self-esteem influence the formation of friendships among adolescents?” “Does number of overtime hours worked cause higher burnout among nurses?”). Specifically, we use our theories and specification of variables to generate hypotheses. A hypothesis is a prediction about a specific event or relationship between variables.

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Definition of a Theory in Quantitative Research

With this background on variables, we can proceed to the use of quantitative theories. In quantitative research, some historical precedent exists for viewing a theory as a scientific prediction or explanation for what the researcher expects to find (see Thomas, 1997, for different ways of conceptualizing theories and how they might constrain thought). For example, Kerlinger’s (1979) definition of a theory seems still valid today. He said that a theory is “a set of interrelated constructs (variables), definitions, and propositions that presents a systematic view of phenomena by specifying relations among variables, with the purpose of explaining natural phenomena” (p. 64).

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In this definition, a theory in quantitative research is an interrelated set of constructs (or variables) formed into propositions, or hypotheses, that specify the relationship among variables (typically in terms of magnitude or direction). A theory might appear in a research study as an argument, a discussion, a figure, a rationale, or a conceptual framework, and it helps to explain (or predict) phenomena that occur in the world. Labovitz and Hagedorn (1971) added to this definition the idea of a theoretical rationale, which they defined as “specifying how and why the variables and relational statements are interrelated” (p. 17). Why would an independent variable, X, influence or affect a dependent variable, Y? The theory would provide the explanation for this expectation or prediction. A discussion about this theory would appear in a section of a proposal on the literature review or in a separate section called the theory base, the theoretical rationale, or the theoretical perspective or the conceptual framework.. We prefer the term theoretical perspective because it has been popularly used as a required section for proposals for research when one submits an application to present a paper at the American Educational Research Association conference.

The metaphor of a rainbow can help to visualize how a theory operates. Assume that the rainbow bridges the independent and dependent variables (or constructs) in a study. This rainbow ties together the variables and provides an overarching explanation for how and why one would expect the independent variable to explain or predict the dependent variable. Theories develop when researchers test a prediction over and over. For example, here is how the process of developing a theory works. Investigators combine independent, mediating, and dependent variables into questions based on different forms of measures. These questions provide information about the type of relationship (positive, negative, or unknown) and its magnitude (e.g., high or low). Forming this information into a predictive statement (hypothesis), a researcher might write, “The greater the centralization of power in leaders, the greater the disenfranchisement of the followers.” When researchers test hypotheses such as this over and over in different settings and with different populations (e.g., the Boy Scouts, a Presbyterian church, the Rotary Club, and a group of high school students), a theory emerges, and someone gives it a name (e.g., a theory of attribution). Thus, theory develops as an explanation to advance knowledge in particular fields (Thomas, 1997).

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Forms of Theories in Quantitative Research

Researchers state their theories in research proposals in several ways, such as a series of hypotheses, if-then logic statements, or visual models. First, some researchers state theories in the form of interconnected hypotheses. For example, Hopkins (1964) conveyed his theory of influence processes as a series of 15 hypotheses. Some of the hypotheses are as follows (these have been slightly altered to remove the gender-specific pronouns):

1. The higher one’s rank, the greater one’s centrality.
2. The greater one’s centrality, the greater one’s observability.
3. The higher one’s rank, the greater one’s observability.
4. The greater one’s centrality, the greater one’s conformity.
5. The higher one’s rank, the greater one’s conformity.
6. The greater one’s observability, the greater one’s conformity.
7. The greater one’s conformity, the greater one’s observability. (p. 51)

A second way is to state a theory as a series of if-then statements that explain why one would expect the independent variables to influence or cause the dependent variables. For example, Homans (1950) explained a theory of interaction: If the frequency of interaction between two or more persons increases, the degree of their liking for one another will increase, and vice versa. . . . Persons who feel sentiments of liking for one another will express those sentiments in activities over and above the activities of the external system, and these activities may further strengthen the sentiments of liking. The more frequently persons interact with one another, the more alike in some respects both their activities and their sentiments tend to become. (pp. 112, 118, 120)

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Third, an author may present a theory as a visual model. It is useful to translate variables into a visual picture. Blalock (1969, 1985, 1991) advocated causal modeling and recasted verbal theories into causal models so that a reader could visualize the interconnections of variables. Two simplified examples are presented here. As shown in Figure 3.1, three independent variables influence a single dependent variable, mediated by the influence of two intervening variables. A diagram such as this one shows the possible causal sequence among variables leading to modeling through path analysis and more advanced analyses using multiple measures of variables as found in structural equation modeling (see Kline, 1998). At an introductory level, Duncan (1985) provided useful suggestions about the notation for constructing these visual causal diagrams:

* Position the dependent variables on the right in the diagram and the independent variables on the left.
* Use one-way arrows leading from each determining variable to each variable dependent on it.
* Indicate the strength of the relationship among variables by inserting valence signs on the paths.
* Use positive or negative valences that postulate or infer relationships. Use two-headed arrows connected to show unanalyzed relationships between variables not dependent upon other relationships in the model.

More complicated causal diagrams can be constructed with additional notation. This one portrays a basic model of limited variables, such as typically found in a survey research study. A variation on this theme is to have independent variables in which control and experimental groups are compared on one independent variable in terms of an outcome (dependent variable). As shown in Figure 3.2, two groups on variable X are compared in terms of their influence on Y, the dependent variable. This design is a between-groups experimental design (see Chapter 8). The same rules of notation previously discussed apply.

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These two models are meant only to introduce possibilities for connecting independent and dependent variables to build theories. More complicated designs employ multiple independent and dependent variables in elaborate models of causation (Blalock, 1969, 1985, 1991). For example, Jungnickel (1990), in a doctoral dissertation proposal about research productivity among faculty in pharmacy schools, presented a complex visual model, as shown in Figure 3.3. Jungnickel asked what factors influence a faculty member’s scholarly research performance. After identifying these factors in the literature, he adapted a theoretical framework found in nursing research (Megel, Langston, & Creswell, 1987) and developed a visual model portraying the relationship among these factors, following the rules for constructing a model introduced earlier. He listed the independent variables on the far left, the intervening variables in the middle, and the dependent variables on the right. The direction of influence flowed from the left to the right, and he used plus and minus signs to indicate the hypothesized direction.

Placement of Quantitative Theories

In quantitative studies, one uses theory deductively and places it toward the beginning of the proposed study. With the objective of testing or verifying a theory rather than developing it, the researcher advances a theory, collects data to test it, and reflects on its confirmation or disconfirmation by the results. The theory becomes a framework for the entire study, an organizing model for the research questions or hypotheses and for the data collection procedure. The deductive model of thinking used in a quantitative study is shown in Figure 3.4. The researcher tests or verifies a theory by examining hypotheses or questions derived from it. These hypotheses or questions contain variables (or constructs) that the researcher needs to define. Alternatively, an acceptable definition might be found in the literature. From here, the investigator locates an instrument to use in measuring or observing attitudes or behaviors of participants in a study. Then the investigator collects scores on these instruments to confirm or disconfirm the theory.

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Writing a Quantitative Theoretical Perspective

Using these ideas, the following presents a model for writing a quantitative theoretical perspective section into a research plan. Assume that the task is to identify a theory that explains the relationship between independent and dependent variables.

1. Look in the discipline-based literature for a theory. If the unit of analysis for variables is an individual, look in the psychology literature; to study groups or organizations, look in the sociological literature. If the project examines individuals and groups, consider the social psychology literature. Of course, theories from other disciplines may be useful, too (e.g., to study an economic issue, the theory may be found in economics).
2. Examine also prior studies that address the topic or a closely related topic. What theories did the authors use? Limit the number of theories and try to identify one overarching theory that explains the central hypothesis or major research question.
3. As mentioned earlier, ask the rainbow question that bridges the independent and dependent variables: What explains why the independent variable(s) would influence the dependent variables?
4. Script out the theory section. Follow these lead sentences: “The theory that I will use is \_\_\_\_\_ (name the theory). It was developed by \_\_\_\_\_ (identify the origin, source, or developer of the theory), and it was used to study \_\_\_\_\_ (identify the topics where one finds the theory being applied). This theory indicates that \_\_\_\_\_ (identify the propositions or hypotheses in the theory). As applied to my study, this theory holds that I would expect my independent variable(s) \_\_\_\_\_ (state independent variables) to influence or explain the dependent variable(s) \_\_\_\_\_ (state dependent variables) because \_\_\_\_\_ (provide a rationale based on the logic of the theory).”

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Qualitative Theory Use

Variation in Theory Use in Qualitative Research

Qualitative inquirers use theory in their studies in several ways. First, much like in quantitative research, it is used as a broad explanation for behavior and attitudes, and it may be complete with variables, constructs, and hypotheses. For example, ethnographers employ cultural themes or aspects of culture to study in their qualitative projects, such as social control, language, stability and change, or social organization, such as kinship or families (see Wolcott’s 2008 discussion about texts that address cultural topics in anthropology). Themes in this context provide a ready-made series of hypotheses to be tested from the literature. Although researchers might not refer to them as theories, they provide broad explanations that anthropologists use to study the culture-sharing behavior and attitudes of people. This approach is popular in qualitative health science research in which investigators begin with a theoretical or conceptual model, such as the adoption of health practices or a quality of life theoretical orientation.

Second, researchers increasingly use a theoretical lens or perspective in qualitative research, which provides an overall orienting lens for the study of questions of gender, class, and race (or other issues of marginalized groups). This lens becomes a transformative perspective that shapes the types of questions asked, informs how data are collected and analyzed, and provides a call for action or change. Qualitative research of the 1980s underwent a transformation to broaden its scope of inquiry to include these theoretical lenses. They guide the researchers as to what issues are important to examine (e.g., marginalization, empowerment, oppression, power) and the people who need to be studied (e.g., women, low economic social status, ethnic and racial groups, sexual orientation, disability). They also indicate how the researcher positions himself or herself in the qualitative study (e.g., up front or biased from personal, cultural, and historical contexts) and how the final written accounts need to be written (e.g., without further marginalizing individuals, by collaborating with participants), and recommendations for changes to improve lives and society. In critical ethnography studies, for example, researchers begin with a theory that informs their studies. This causal theory might be one of emancipation or repression (Thomas, 1993).

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As the 20th century draws to a close, traditional social science has come under increasing scrutiny and attack as those espousing critical and postmodern perspectives challenge objectivist assumptions and traditional norms for the conduct of research. The critical tradition is alive and well in the social sciences. Postmodernists reject the notion that knowledge is definite and univocal. Central to this attack are four interrelated assertions: (a) Research fundamentally involves issues of power; (b) the research report is not transparent but rather it is authored by a raced, gendered, classed, and politically oriented individual; (c) race, class, and gender (the canonical triumvirate to which we would add sexual orientation, able-bodiedness, and first language, among others) are crucial for understanding experience; and (d) historically, traditional research has silenced members of oppressed and marginalized groups. (p. 91)

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Mixed Methods Theory Use

Theory use in mixed methods studies may include using theory deductively, in quantitative theory testing and validity, or in using it inductively as in an emerging qualitative theory or pattern. In addition, there are several unique ways that theory is incorporated into a mixed methods study in which researchers collect, analyze, and integrate both quantitative and qualitative data using diverse mixed methods designs. This framework has taken two forms: (a) the use of a social science framework and (b) the use of a participatory–social justice framework. Both of these forms have emerged in the mixed methods literature over the past 5 to 10 years (see Creswell & Plano Clark, 2011).

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Social Science Theory Use

A social science theory can become an overarching framework for mixed methods research. This social science theory may be drawn from diverse theories found in the social sciences, such as leadership, economics, political science, marketing, behavioral change, adoption or diffusion, or any number of social science theories. It may be presented as a literature review, as a conceptual model, or as a theory that helps to explain what the researcher seeks to find in a study.

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Participatory–Social Justice Theory Use

The use and acceptability of participatory–social justice theories in mixed methods research have been growing in the last decade. Undoubtedly, the impetus for this has been the work of Mertens (2003, 2009), who has not only conveyed the major purpose of this theory but also how it might be incorporated into the general research process and mixed methods. Both participatory and social justice frameworks have the effect of involving participants collaboratively in the research, bringing about change to address inequities, and helping underrepresented groups and populations. A number of empirical articles have appeared in the Journal of Mixed Methods Research advancing this theory-use in mixed methods, including a study of women’s interest in science (Buck, Cook, Quigley, Eastwood, & Lucas, 2009) and a study of women’s social capital (Hodgkin, 2008). A paper by Sweetman (2008) identified 34 mixed methods studies that utilized a transformative framework. Then in 2010, Sweetman, Badiee, and Creswell (2010) discussed transformative criteria—drawing on Mertens (2003, 2009)—that might be incorporated into mixed methods studies and surveyed 13 studies that included elements of the criteria.

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The literature is growing on the use of this theoretical orientation framework and mixed methods research. It seems especially applicable to the study of community health issues and the study of marginalized groups, wherever they might appear in the world. Undergirding this theoretical orientation would be a broader philosophical stance, the transformative framework, as discussed in Chapter 1. In Chapter 1, we discussed the transformative worldview as one of the four primary worldviews that would inform quantitative, qualitative, and mixed methods research. Indeed, one could question whether the transformative framework lies at a broad, philosophical worldview level or at a narrower, more theoretical level informing what one might learn and explain in a study. Two issues have dominated the discussion of using a transformative framework in mixed methods: (a) What is a transformative framework? and (b) How would a mixed methods researcher incorporate it into a rigorous, sophisticated mixed methods study? Here we discuss it as a theoretical framework that can surround and inform a mixed methods project.

Reference:

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