1

QUALITATIVE COMPARATIVE ANALYSIS AS PART OF A MIXED METHODS APPROACH

LEARNING OBJECTIVES

1. Explain different types of mixed methods study designs.
2. Define and describe QCA and how it compares to qualitative and quantitative methods.
3. Describe underlying assumptions of causal complexity.
4. Explain how QCA can be used as part of mixed methods studies.
5. Review the book structure and guiding QCA heuristic.

This chapter introduces readers to the use of qualitative comparative analysis (QCA) as part of a mixed methods study. We briefly summarize mixed methods design and factors to consider when designing a mixed methods study that uses QCA. These considerations include the integration of qualitative and quantitative data, the timing of qualitative and quantitative data collection, and using QCA to integrate qualitative and quantitative methods. We also provide an overview of the QCA method itself, comparing it to qualitative and quantitative analyses and by describing key assumptions underlying QCA. We conclude by discussing how QCA can be used within a mixed methods approach and offer examples of how several research teams have used it.

OVERVIEW OF MIXED METHODS STUDY DESIGNS

The world is complex, and understanding it often requires examining phenomena from multiple perspectives and approaches. Mixed methods bring together qualitative and quantitative approaches into a single study and rely upon the complementary strengths of each approach to address a study question or several questions (Curry & Nunez-Smith, 2015). Integrating qualitative and quantitative data collection and analysis into a single study can yield a more comprehensive understanding of the phenomenon and more justifiable results (Plano Clark & Ivankova, 2016). Mixed methods approaches are useful in research and in evaluation.

Although mixed methods researchers may use different names for mixed methods designs, we draw on those outlined by Curry and Nunez-Smith (2015) and Creswell and Plano Clark (2018). These methodologists propose three basic mixed method study designs: convergent, exploratory sequential, and explanatory sequential. *Table 1-1* summarizes the designs and their methodological characteristics.

These designs differ based on three considerations: integration of data (i.e., how the qualitative and quantitative data are brought together), timing or sequencing of data collection, and priority of methods. A convergent design involves concurrent qualitative and quantitative data collection; the researcher compares (merged integration) or combines (embedded integration) findings from each type of analysis. An exploratory sequential design begins with qualitative data collection followed by quantitative data collection; the analysis of the qualitative data informs the development and implementation of quantitative measures or instruments (connected integration) and/or contextualizes the secondary quantitative findings (embedded integration). An explanatory sequential design starts with quantitative data collection; this quantitative data collection could build toward the qualitative (connected integration) or serve as

TABLE 1-1 ■ Types of Mixed Method Study Designs

Design Type	Integration Type	Timing of Data Collection
Convergent design	Merged or embedded	Concurrent qualitative and quantitative data collection
Exploratory sequential design	Embedded or connected	Qualitative precedes quantitative
Explanatory sequential design	Embedded or connected	Quantitative precedes qualitative

the primary data collection type with a supplementary qualitative component (embedded integration). These study design types can be linked in a multi-phase mixed methods study (e.g., conducting an exploratory sequential study followed by an explanatory sequential design) (Creswell & Plano Clark, 2018; Curry & Nunez-Smith, 2015).

Merged integration occurs when researchers collect and analyze qualitative and quantitative data, use the findings to interpret different facets of a research question, and draw upon the complementary strengths of each method (Curry & Nunez-Smith, 2015). For example, Cooper and Hall (2016) wanted to understand low graduation rates among Black male student athletes and conducted a mixed methods study to learn (1) the students' motivation for attending a historically Black college or university, (2) how the students understood their college experiences, and (3) what factors were associated with academic achievement among Black student athletes. To address the first two questions, the researchers conducted interviews and focus groups as well as examined institutional documents. To gather information for the third question, they conducted a survey of athletes. After data collection and analysis, they used the information from each data source to corroborate findings in the other.

Embedded integration refers to having a primary method (and/or research questions), then nesting a secondary method within the primary method (Curry & Nunez-Smith, 2015). The secondary method may address sub-questions or secondary aspects of the primary aim. For instance, in a study of a Tibetan yoga intervention to improve cancer patients' quality of life, Leal et al. (2016) built a qualitative component into a randomized controlled trial (RCT). The qualitative component enabled the researchers to learn about how the patients experienced the intervention and the personal changes that arose from doing yoga. The RCT component assessed the effectiveness of the intervention.

Finally, connected integration occurs when different types of data build on the other (Curry & Nunez-Smith, 2015). A researcher may use formative interviews to develop survey items or use survey findings to sample purposively for in-depth interviews. For connected integration, one type of data collection usually occurs before the other. For example, Shammas (2017) initially conducted a survey of Arab and Muslim American college students to determine whether they perceived more discrimination on campus than their peers in other racial and ethnic minorities, and if so, whether perceiving more discrimination meant that they established more homogeneous friendships groups (i.e., to create social integration and sense of belonging). Although she found that the Arab and Muslim American students perceived more discrimination, they did not have more homogeneous friendship groups compared to other racial and ethnic minorities. This finding was puzzling, and she wondered whether the discrimination measure was flawed. She investigated this by following the survey with focus groups and learned that student perceptions of discrimination were more complicated than her survey items captured.

The second consideration for mixed methods study design is timing or order of the qualitative and quantitative data collection (Curry & Nunez-Smith, 2015). One type of data collection could occur before the other, or the researcher could collect the two simultaneously. Timing depends on the research question and the purpose of each type of data. For example, if the researcher needs qualitative data to explain or elaborate on quantitative findings, the quantitative data collection should occur first. Alternately, if the study team needs information from interviews to develop a survey, then the qualitative data collection occurs first. If the two types of data inform different facets of a question or different questions, then data collection can occur concurrently. Timing, therefore, is related to the type of integration for the study.

The third consideration for mixed methods study design is priority or the weight of the methods (Morse & Niehaus, 2009). This factor captures the relative importance of each method for the study; one method could be more central to the study than the other. Both could have equal importance, especially when the two methods address different questions or different aspects of a single question (Creswell & Plano Clark, 2018; Tashakkori & Teddlie, 1998). However, some argue that the relative importance may not always be known or fully understood at the time of study design and that assigning priority to one method over the other may result in devaluing the lower weighted component (Curry & Nunez-Smith, 2015).

As we will elaborate in the section below, QCA refers to a research approach and an analytic technique that uses set-theory (Schneider & Wagemann, 2012). QCA can accommodate qualitative and quantitative data in a single analysis, which may make it a useful approach for mixed methods studies that have research questions focusing on combinations of factors (See Chapter 2 for more information on appropriate research questions for QCA). In using QCA as part of a mixed methods approach, data integration, timing of data collection, and priority are key considerations. A QCA can be the point of integration or can be a distinct analysis that informs the final integration of the methods or findings. Issues related to priority can arise when a researcher triangulates information from qualitative and quantitative data sources within a QCA. Sometimes the two data sources may provide contradictory information. For instance, survey responses from an organization may indicate that an intervention had a lot of staff support, but several key informants could report that the intervention did not have much support. In those circumstances, the research team may need to prioritize one source of information over the other and provide a rationale for that decision. We will return to the use of QCA in mixed methods later in this chapter, and we devote the last chapter of this volume to further detailing the use of QCA within mixed methods studies. In the next section, we elaborate on QCA and compare it with other methods typically used in a mixed methods study.

HOW QCA COMPARES TO OTHER QUANTITATIVE AND QUALITATIVE METHODS

When trying to understand a complex phenomenon, researchers can use multiple methodological approaches, such as qualitative and quantitative data collection and analysis. Each approach offers a distinct perspective and often address different questions. In general, qualitative research focuses on delineating complex social processes, and quantitative research seeks to estimate the magnitude of effects of causal factors and identifies parsimonious results. Each method has limitations. Qualitative research often requires resource intensive data collection using a small number of cases and lacks broad generalizability. Quantitative research is often not equipped to capture social phenomena and the complexity of the cases being studied. In the 1980s, a comparative political and historical sociologist named Charles Ragin developed QCA to address limitations of the two methods, while retaining the strengths of each method (Ragin, 1987, 2000). Since then, others have contributed to the further development and refinement of the method (Baumgartner, 2013, 2015; Baumgartner & Epple, 2014; Caren & Panofsky, 2005; Schneider & Wagemann, 2006; Schneider & Wagemann, 2010; Schneider & Wagemann, 2012; Thiem, 2014; Vink & van Vliet, 2009). As Jambor (2009, p. 66) summarizes, "Qualitative Comparative Analysis brings some of the methodological discipline and rigor of quantitative analysis to qualitative analysis and some of the causal complexity and inductive sensitivity of qualitative analysis to quantitative analysis." We compare and contrast the analytic orientations of qualitative and quantitative research with QCA in *Table 1-2*. The rest of this section compares qualitative and quantitative analyses with QCA and explains the assumptions that underpin QCA and distinguish it from other methods.

In qualitative data collection and analysis, researchers explore processes and phenomenon and detail their form, function, and complexity. In general, qualitative studies are often described as case-oriented, delving into a single or a small number of cases with triangulation of multiple data sources to describe complexity, identify themes, and generate hypotheses. These relationships are described nonnumerically, using adjectives to convey the "strength" of relationships identified. Qualitative researchers pursue a range of data sources, including textual data, key informant interviews, ethnographic observations, and focus groups that give them detailed, rich data. Depending on the study, analysis may be deductive, inductive, or a hybrid of the two. Findings may have limited generalizability to the larger population of cases but can be useful for generating hypotheses and providing a deeper understanding of the phenomena of interest. Critics of conventional qualitative methods argue that

TABLE 1-2 ■ Comparison of Qualitative, Quantitative, and QCA Analytic Orientations

	Qualitative	Quantitative	QCA
Analytic orientation	Case oriented	Variable oriented	Case oriented
Analytic foundation	Iterative complex reasoning through inductive and deductive interpretation of nonnumeric data	Statistical methods; correlation, regression	Set-theory, formal logic
Types of data	Nonnumeric • Key informant interviews • Focus groups • Ethnographic observations • Documents • Case studies	Numeric • Survey data • Public health surveillance data • Economic data • Test scores • Biologic measures • Data transformation commonly employed	Numeric or nonnumeric • Data transformation commonly employed
Uses	• Identifies similarities and differences in narrative case and comparative case studies • Does cross-case comparison • Generates hypothesis	• Estimates the magnitude and direction of effect of an explanatory factor • Develops prediction models • Tests hypotheses with statistical methods	• Identifies different and multiple combinations of factors that are necessary or sufficient for an outcome • Conducts systematic cross-case comparison

Generalizability	Purposive case selection • Generalizability limited to types of cases included in sample	Dependent on sampling method employed, but typically generalizable to larger population	Purposive case selection (typically) • Generalizability limited to types of cases included in sample
Strengths	• Provides holistic, deep understanding of complex phenomenon • Examines explicit causal connections • Can derive meaning from small numbers of cases	• Allows precise estimation of net effects • Can derive meaning from large numbers of observations • Is a replicable process • Provides parsimonious results	• Preserves cases as holistic units throughout the analysis • Identifies causally complex relationships • Transparency of analytic decisions
Weaknesses	• Can lack systematic definitions of concepts • Analytic process often not transparent or replicable	• Has limited ability to analyze complex social phenomena • Requires large sample sizes to meet underlying statistical assumptions	• Application limited to addressing configural research questions • Limited utility as a stand-alone analysis

such studies may lack formalization of concepts, transparency in the research process, and replicability across studies.

Quantitative data collection and analysis are variable oriented, with a focus on numeric measures from representative samples of a larger population using data sources such as surveys, directly measured observations (e.g., physiologic parameters), or data captured for non-research activities (e.g., student test scores, economic trend data, or public health surveillance data). Each observation in an analysis is deconstructed into its component variables. Typical quantitative analyses involve inferential statistics, where the goal is to assess each variable's

independent contribution to an outcome or identify how an individual factor, holding all other factors constant, will increase (or decrease) the likelihood of an outcome (i.e., the net effects of an individual factor). Findings from such analyses are useful for empirically testing hypotheses through experimental or observational study designs but may offer limited information beyond estimating a magnitude and direction of an effect. Further, with the focus on net effects of individual variables, traditional quantitative methods do not capture complex interactions well, as interaction effects with three or more variables are difficult to interpret. Lastly, these methods require a large enough sample size to meet the assumptions underlying the statistical methods used.

QCA is a case-oriented method in the family of configurational comparative methods; methods that are distinct and unique from qualitative methods (e.g., grounded theory) and inferential statistical methods (e.g., regression). It originated from the field of comparative social and political science and uses set-theory, a branch of mathematics, to identify nonstatistical relationships among explanatory factors and an outcome using qualitative data, quantitative data, or both derived from the cases included in the analysis. QCA involves mathematical set-theory (similar to formal logic) but is not a statistical method. Thus, QCA does not require any of the common assumptions underlying most statistical methods. QCA can be used to address configural research questions; these are questions formulated to identify combinations of explanatory factors found among cases with a specified outcome, and results from a QCA are expressed as solutions. Chapter 2 describes configural research questions and solutions, and it introduces readers to other terminology unique to the field of set-theoretic methods.

Developers of QCA contended that traditional variable-oriented statistical techniques with large sample-size requirements were not well suited for explaining complex social phenomena, yet qualitative methods often lacked a systematic, formal method for cross-case comparison. QCA addresses both issues; not only does it maintain cases as a holistic unit, a feature of qualitative research, but it can also generate parsimonious cross-case findings, a feature of quantitative analysis (Ragin, 1987; Rihoux & Ragin, 2009). Similar to qualitative research, the ability of QCA to generalize depends on how cases were selected into the analysis and the extent to which the cases selected represent the broader population. In most qualitative research (and QCA), cases are not randomly selected into the analysis; they are chosen for a reason. This approach is not a weakness per se; it reflects the different orientation and goals of research designed to test hypotheses and generalize to broad populations versus research designed to generate and explore hypotheses within complex social phenomena. *Box 1-1* summarizes various worldviews that orient researchers and their choices.

BOX 1-1 Worldviews Informing Researcher Orientation

Creswell & Plano Clark (2018) elaborate four main worldviews that can underlie researchers' pursuits of data and interpretation of results. These are postpositivism, constructivism, transformative, and pragmatism. Postpositivism refers to beliefs that one objective, measurable reality exists and can be assessed by testing variables and their relationships; hypothesis testing is a feature of this worldview, which is typically associated with quantitative methods. Constructivism, often associated with qualitative methods, involves beliefs and assumptions that no single reality exists. Rather researchers must obtain multiple perspectives to understand the meanings people ascribe to social relationships; this worldview is characterized by developing theory based on patterns identified from the multiple perspectives represented in the data. The transformative worldview emphasizes inequality and focuses on empowering the oppressed. Researchers, assuming a transformative worldview, employ collaborative research approaches with the goal of changing the social world for disadvantaged persons. Finally, pragmatism relies on identifying "what works" to address a research question. This often entails integrating multiple methods to provide a comprehensive answer to the question; hence, many mixed methods researchers often have this worldview. Researchers who use QCA could have any or a mix of these worldviews, although because of its origins in comparative historical social science and the focus on having in-depth knowledge of cases, they may have more of a constructivist orientation. Additionally, QCA enables hypothesis generation, consistent with a constructivist worldview. That said, QCA is also said to have deterministic characteristics, as it looks at combinations of factors and their relationship to an outcome, much like the postpositivist worldview (QCA, however, is not a deterministic method) (Schneider & Wagemann, 2012). Further, Schneider and Wagemann have elaborated an approach for hypothesis testing in QCA (i.e., positivistic orientation). Researchers with a transformative perspective could also use QCA; the data collection and analysis process can involve principles of collaboration with communities and social justice, although it does not necessarily need to do so. Finally, researchers interested in QCA can come from a pragmatic worldview. As we will note in Chapter 2, to use QCA, a researcher begins with a configural question. The methods—qualitative or quantitative—used to collect data will vary depending on the study as well as the feasibility of collecting appropriate data. Thus, the use of QCA itself does not imply a particular worldview.

Reflection

- Think about your own research area. What research questions might be addressed best by quantitative methods? Qualitative methods? By QCA? What makes each method appropriate for the question(s)?

UNDERLYING ASSUMPTIONS OF CAUSAL COMPLEXITY

So far, we have discussed the usefulness of QCA for exploring complex phenomena; this section explains and elaborates the underlying assumptions of causal complexity that QCA is well-suited for identifying within empiric data. Ragin (1999) describes three concepts that define causal complexity: equifinality, conjunctural causation, and asymmetrical causation. We discuss each of these in turn in the rest of this section and provide some cautionary words about the term *causality* in *Box 1-2*.

Equifinality is the concept of having multiple, nonexclusive pathways to achieve an outcome. In this context, a "pathway" refers to one or more combinations of explanatory factors. The equifinality assumption underlies many complex phenomena that researchers study, because more than one explanatory pathway can lead to the same outcome. In the real world, we often see that different types of policies, programs, or interventions can achieve the same goals. QCA can produce equifinal results (if such findings are present in the data). In contrast, traditional quantitative analyses assume unifinality and produce findings consistent with that assumption. A simple example illustrates this concept. Say a person wants to learn how to make a chocolate chip cookie. An equifinal approach would identify multiple recipes for making a chocolate chip cookie; each individual cookie recipe the person found would have merit on its own and would result in multiple pathways for creating a chocolate chip cookie. A unifinal approach would take all the recipes the person found and average the amount of butter, flour, eggs, vanilla, and so forth across all recipes to create a single chocolate chip cookie recipe.

The second assumption that underlies QCA is conjunctural causation. This assumption means that an individual explanatory factor may not have a relationship to an outcome on its own but could be part of a combination of explanatory factors that relate to the outcome. This assumption enables QCA to evaluate combinations of explanatory factors as a holistic unit in a more systematic and replicable way than many qualitative approaches. This approach avoids deconstructing cases to focus on the net independent effect of each explanatory factor. For example, to produce a delicious chocolate chip cookie, one would need to include all the ingredients together—flour, butter, sugar, eggs, salt, etc. That is conjunctural causation. A net effects approach would ask the extent to which each individual ingredient contributed to the deliciousness of the cookie. Of note, conjunctural

causation *is not* the same as an interaction effect (Thiem, Baumgartner, & Bol, 2016). On the surface, they may appear the same, but the underlying mathematics and assumptions are different. An interaction effect indicates that one variable's value varies based on another variable's value; conjunctural causation does not imply an algebraic inverse or direct relationship between causal factors. Further, three-way (and more) interaction effects are difficult to interpret and often result in multicollinearity in a regression model (Fiss, Sharapov, & Cronqvist, 2013).

Finally, the third assumption underlying QCA is asymmetrical causation, also a characteristic of many complex social phenomena. Whereas symmetrical causation is the underlying assumption of most statistical methods, asymmetrical causation suggests that even though the presence of an explanatory factor produces the outcome, one cannot assume that the absence of the factor leads to the *nonoccurrence* of the outcome. For example, if a researcher finds that smoking cigarettes leads to lung cancer, she cannot assume that not smoking leads to the absence of lung cancer; an assumption that has been validated by the observation that nonsmokers also develop lung cancer. Thus, developing lung cancer has an equifinal solution, a hypothesis that has also been validated through the identification of environmental exposures (e.g., radon and asbestos) in association with lung cancer. In QCA, the occurrence and nonoccurrence of an outcome are distinct phenomena, and the pathways to each may not be the simple inverse of explanatory factors. Thus, in QCA, a researcher examines the solutions or pathways for the occurrence and nonoccurrence of the outcome separately in the analysis.

When the goal of a specific research endeavor is to answer questions that entail causal complexity among cases and an outcome, QCA is an appropriate method to choose. Equifinality offers the advantage of identifying multiple pathways; conjunctural causation enables the researcher to explore the cooccurrence of explanatory factors together. Having different combinations of factors that produce the outcome is common in real-life situations. Many roads, after all, can lead to Rome. Asymmetry also encourages researchers to examine the pathways to the outcome as well as the nonoccurrence of the outcome, as it implies that the pathways to each may be entirely different (and not merely the inverse of each other).

BOX 1-2 QCA and Causal Analysis

Some QCA textbooks refer to QCA as a mechanism for causal analysis, causal interpretation, or as a method for understanding causal mechanisms (Schneider & Wagemann, 2012). However, different disciplines and different reviewers often have distinct notions about study designs and types of analyses that can be used for causal analysis. For example, in biomedical research, the randomized controlled trial is the gold standard for causal analysis related to the effect

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of a medication on an outcome, such as a health event or symptom. In observational studies, which are common in health services, educational, social policy, management, and public health fields, relationships between independent and dependent variables are often expressed as inferences of association rather than causal inferences. Similarly, in qualitative research, findings are often expressed as hypothesis generating, as opposed to definitive causal inferences. The terminology that a researcher uses around causation in describing their findings from a QCA can sometimes be a flashpoint for peer reviewers. Although we think it is possible for a QCA to be designed to provide robust causal analysis, we suggest avoiding the term *causal inference* to minimize reader and reviewer confusion with inferential statistical techniques often used for causal inference. We further suggest that researchers provide a robust justification and rationale for causal claims resulting from an analysis.

Reflection

- How can equifinality, conjunctural causation, and asymmetrical causation enhance one's understanding of complex phenomena, programs, or interventions?
- How does conjunctural causation differ from interaction effects?
- What may be another example of asymmetrical causation you have observed in your research field or in everyday life?

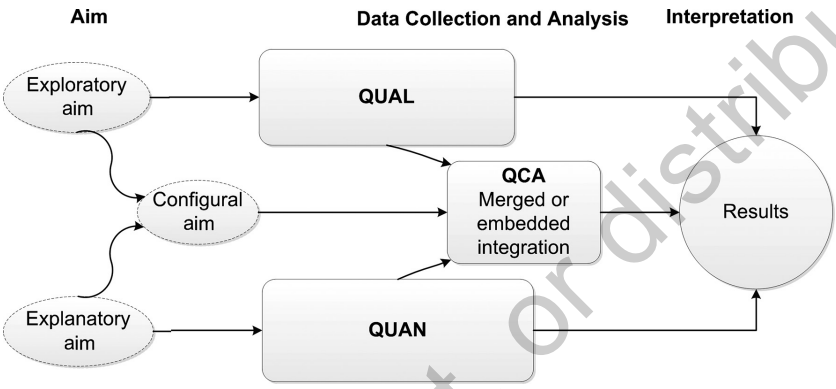
QCA IN MIXED METHODS STUDIES

QCA is not only an analytic method distinct from qualitative or quantitative approaches, but it also orients one's study design and data collection by informing case, explanatory factors, and outcome selection. In this next section, we discuss how QCA can fit into the three mixed methods designs previously discussed.

Figure 1-1 situates QCA within a convergent mixed methods design. The qualitative and quantitative data are collected separately; each may address a separate research aim as well as come together in a QCA to address a configural research question. Further, the qualitative and quantitative data can aid in interpreting the QCA results. In doing so, researchers examine their cases to understand how and why the QCA solutions work or what mechanisms the QCA combinations of explanatory factors trigger. Typically, examining the cases depends on the qualitative data to explain the QCA solutions. For example, Rohlfing and Schneider (2016) propose using process tracing, an analytic approach to delineating

sequences within cases, to unpack the relationships between QCA solutions and the outcome; process tracing along with other methods are discussed further in Chapter 7. We interviewed a researcher that used QCA within a mixed methods convergent design about her approach and experience; this is summarized in *Box 1-3* (Holtrop, Potworowski, Green, & Fetters, 2016).

FIGURE 1-1 ■ Convergent Design With QCA



Source: Adapted from Curry and Nunez-Smith (2015).

BOX 1-3 Example from the Field

Holtrop, J. S., Potworowski, G., Green, L. A., & Fetters, M. (2016). Analysis of novel care management programs in primary care: An example of mixed methods in health services research. *Journal of Mixed Methods Research*. doi:10.1177/1558689816668689

Dr. Jodi Summers Holtrop and her team evaluated care management programs. Implementing care management usually involves having a care manager, often a nurse or social worker, help patients with chronic disease to improve their health and well-being by providing health behavior change goal setting and planning, education on their disease, coordinating care among patients' different providers and across settings, and facilitating use of community resources. Previous research found mixed results on whether care management programs were effective in delivering improved patient outcomes at a reasonable cost. The study team hypothesized that these mixed results might have arisen from the different implementation strategies and contextual situations (insurance coverage for care management, availability of staff, office space, etc.). The goal of this

(*Continued*)

(*Continued*)

study was to explore what program structure and organizational features were related to improved care management implementation.

The research team compared programs that delivered care management: (1) via phone by nurses employed by a health insurer, (2) via phone by nurses working locally at an affiliated practice association, and (3) by nurses or other professionals embedded as a team member in physician offices using both in-person and phone visits with patients. Using a convergent mixed methods design, they collected quantitative and qualitative data. Quantitative data included practice, provider, practice staff member and patient surveys, and data extracted from medical records and insurance claims. Qualitative data consisted of interviews with physician organization leaders, clinicians (physicians and nurses), practice managers, other clinic staff, care managers, as well as direct observations in care management delivery settings.

The research team completed two separate and converging analyses. First, they compared the clinical and cost outcomes of the three program approaches using standard statistical methods. The results indicated that embedded care manager programs delivered better outreach, patient engagement, and cost outcomes than the other program approaches. For clinical outcomes, results were not significantly better for any one program.

Next, they completed an extensive qualitative analysis of the factors impacting implementation success. Through an extensive process of group meetings with discussion and reconciliation, team members identified and examined overall emergent themes. Additionally, the team members participated in a data transformation process to numerically score each practice for each identified dimension considered important to implementation. To complete the QCA, the group used these scores to calibrate the responses. Conditions in which there was no variation were excluded as they were thought to contribute little to variation in implementation. Several combinations of conditions were found to be sufficient for high-quality care management, especially if they existed together.

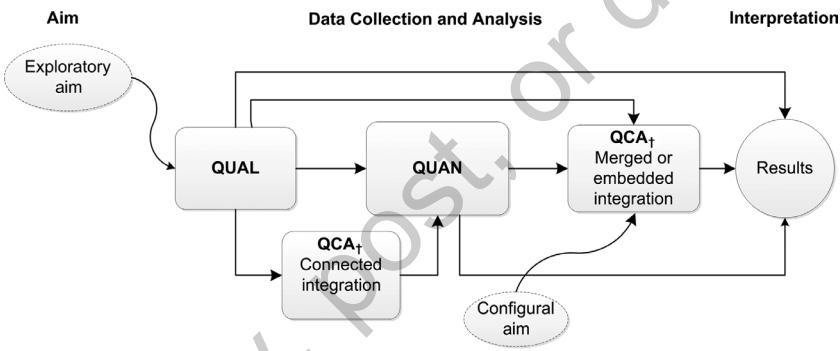
The researchers identified several important aspects for successfully conducting a QCA. This included having a multidisciplinary team devoted to working together, planning for and setting aside enough time to reconcile scores and discover meaning in the rich qualitative data (in this case the on-the-ground implementation processes and factors in care management), and having a comprehensive understanding of the QCA process and software.

Figure 1-2 displays QCA within an exploratory sequential design. A researcher could collect qualitative data first, use it for a QCA, and then use the QCA findings to inform quantitative data collection and analysis. Alternately, a researcher could implement a conventional exploratory sequential design, integrate the qualitative and quantitative data into a QCA, and then use all three analyses in reporting final results. Fiss, Sharapov, and Cronqvist (2013) propose several approaches to incorporating QCA solutions in quantitative models, such as integrating QCA solutions into a regression model or into econometric modeling approaches. For example, a researcher could conduct interviews with a small

number of physicians to learn what aspects of their work provide them with job satisfaction and then use the information from the interviews to develop a physician job satisfaction survey. After administering the survey, the researcher could assess what combinations of job characteristics lead to high levels of satisfaction among these health care providers.

Explanatory sequential designs follow a similar trajectory, except with the quantitative data collection occurring first as shown in *Figure 1-3*. In this design, a researcher might use the quantitative data in a QCA to develop typologies and then purposively sample cases for qualitative data collection and analysis. For example, Winand, Rihoux, Robinson, and Zintz (2013) conducted a study of regional sports governing bodies to understand what combinations of organizational factors are related to high performance. To identify organizations that differed from one

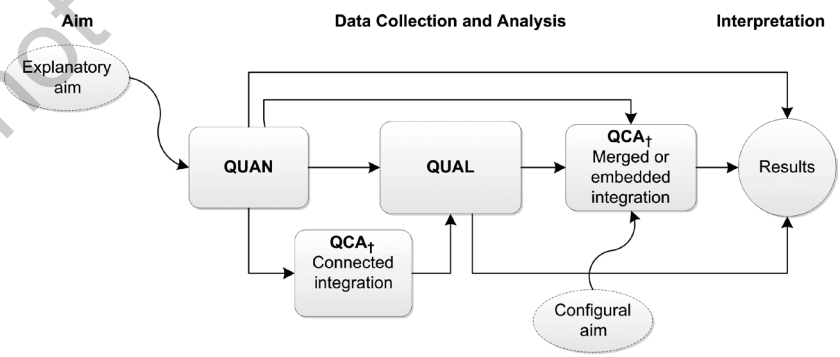
FIGURE 1-2 ■ Exploratory Sequential Design With QCA



† QCA may be used in multiple places as part of the overall design.

Source: Adapted from Curry and Nunez-Smith (2015).

FIGURE 1-3 ■ Explanatory Sequential Design With QCA



† QCA may be used in multiple places as part of the overall design.

Source: Adapted from Curry and Nunez-Smith (2015).

another on organizational factors, the study team first administered a survey to 49 regional sports governing bodies; from those 49, they selected 18 for qualitative assessment. The study team conducted in-depth interviews with staff and reviewed annual reports from those 18 organizations. After coding the qualitative information, they developed QCA explanatory factors and conducted an analysis.

Across the three mixed methods designs, QCA can serve as point of merged or embedded integration. This includes integrating data from the qualitative and quantitative methods into an analysis focused on a configural research question and integrating findings across all components (e.g., qualitative, quantitative, QCA) to draw conclusions. In explanatory or exploratory sequential designs, QCA can also provide a point of connected integration between sequenced data collection and the qualitative and quantitative (or vice versa) components. In general, QCA best serves as a complementary method that supports and augments findings from traditional qualitative or quantitative methods.

PRACTICE TIP 1-1

JOURNAL MANUSCRIPTS

When writing peer-reviewed journal manuscripts, researchers often find it is impossible to describe an entire mixed method evaluation in one paper, so pieces of the evaluation might get carved out into separate manuscripts. In these circumstances, present the QCA in the context of the larger mixed method evaluation as opposed to a single, standalone analysis from which all conclusions might be drawn. For example, quantitative and qualitative data can be used to develop the explanatory factors used in the QCA (see Chapter 4), or qualitative data can support the interpretation of QCA findings. Chapter 9 includes additional suggestions for publishing studies that use QCA.

Reflection

- What benefits might QCA bring to a mixed methods study?
- How is situating a QCA in a mixed methods study beneficial to the QCA portion of the analysis?

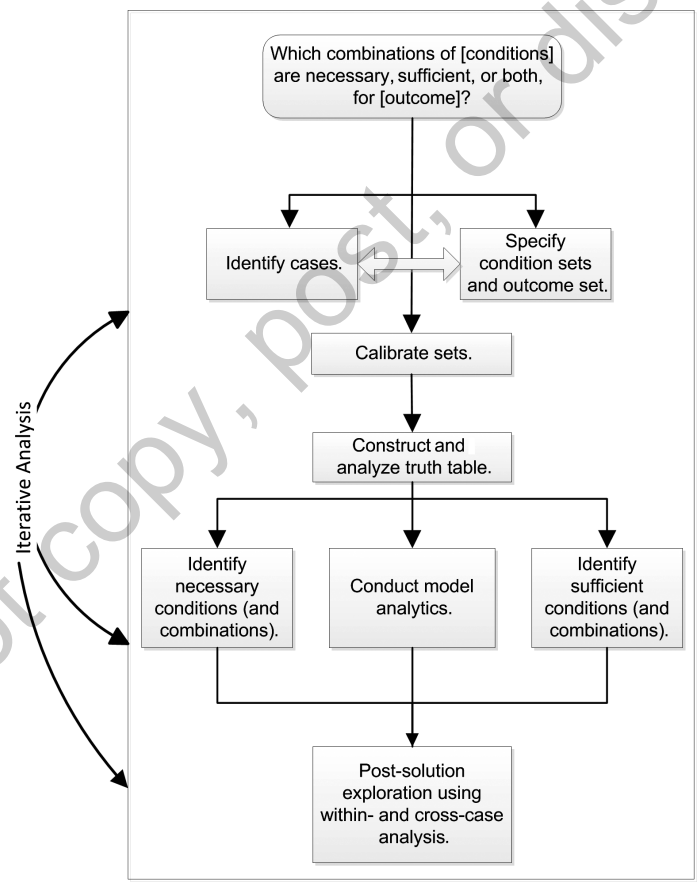
OVERVIEW OF THE REST OF THE BOOK AND GUIDING QCA HEURISTIC

In the following chapters, we describe the steps involved for conducting a QCA and will show how it can integrate different types of data and be used within mixed methods designs. QCA can be viewed as both a research approach as well

as an analytic technique (Schneider & Wagemann, 2012). As an approach, it includes processes for selecting cases, explanatory factors, and outcomes that involves iterative specification and analysis, or what Ragin (1987) calls the back- and forth between ideas and data. Trying to conduct a QCA without a thoughtful approach often leads to odd and unconvincing shoe-horning of the data. As a technique, QCA uses a specific form of mathematics and analytic devices to compare cases systematically using rules of logic.

We created *Figure 1-4* to depict steps for conducting a QCA. We will use this heuristic throughout most of the chapters to orient readers to steps in the process. In Chapter 2, we discuss when it is appropriate to use QCA, how to develop

FIGURE 1-4 ■ Guiding QCA Heuristic



Adapted from Kane, H., Lewis, M. A., Williams, P. A., & Kahwati, L. C. (2014). Using qualitative comparative analysis to understand and quantify translation and implementation. *Transl Behav Med*, 4(2), 201–208. doi: 10.1007/s13142-014-0251-6

a configural research question for use with QCA, and how to understand sets and set relationships and method-specific notation. In Chapter 3, we describe how to select cases, conditions (i.e., explanatory factors), and an outcome, and in Chapter 4, we elaborate on the critical process called set calibration. Chapter 5 moves into the analytic technique, which involves constructing a truth table, computing parameters of fit, and identifying necessary and sufficient conditions and combinations. Chapter 6 discusses the process of conducting "model analytics" on initial results to inform analysis respecification, and in Chapter 7, we describe strategies to support the interpretation of QCA solutions. Chapter 8 introduces several QCA variants, nontraditional applications, emerging techniques, and controversies. Chapter 9 describes how to prepare proposals, reports, manuscripts, and presentations for studies and evaluations conducted using QCA and strategies for responding to peer review. Finally, in Chapter 10, we detail two examples of a mixed methods studies that incorporated QCA.

Summary and Key Points

This chapter summarized different mixed methods designs, introduced QCA and how it compares to other methods, and explained how QCA fits into a mixed methods study. Key points include the following:

- A mixed methods research approach brings together qualitative and quantitative approaches into a single study and builds upon the complementary strengths of each approach.
- Mixed methods research attends to several considerations in study design: integrating the data collected, timing or sequencing of data collection, and determining priority or weight of method; some of these priorities can influence the use of QCA.
- QCA uses formal logic and set theory to identify relationships among explanatory factors and an outcome; it can include qualitative data, quantitative data, or both in the analysis.
- QCA does not require any of the common assumptions underlying most statistical methods; instead, QCA rests on assumptions of causal complexity, which include equifinality, conjunctural causation, and asymmetry.
- QCA fits into the mixed methods designs by integrating the qualitative and quantitative data into a single analysis, providing an analytic step between sequenced data collection, and/or supplementing a secondary point of integration.