Article

Flexible Coding of In-depth Interviews: A Twenty-first-century Approach

Nicole M. Deterding[1] and Mary C. Waters[2]

Abstract

Qualitative coding procedures emanating from grounded theory were limited by technologies of the 1960s: colored pens, scissors, and index cards. Today, electronic documents can be flexibly stored, retrieved, and cross-referenced using qualitative data analysis (QDA) software. We argue the oft-cited grounded theory framework poorly fits many features of contemporary sociological interview studies, including large samples, coding by teams, and mixed-method analysis. The grounded theory approach also hampers transparency and does not facilitate reanalysis or secondary analysis of interview data. We begin by summarizing grounded theory's assumptions about coding and analysis. We then analyze published articles from American Sociological Association flagship journals, demonstrating that current conventions for semistructured interview studies depart from the grounded theory framework. Based on experience analyzing interview data, we suggest steps in data organization and analysis to better utilize QDA technology. Our goal is to support rigorous, transparent, and flexible analysis of in-depth interview data. We end by discussing strengths and limitations of our twenty-first-century approach.

[1] Institute for Research on Poverty, University of Wisconsin–Madison, Madison, WI, USA
[2] Harvard University, Cambridge, MA, USA

Corresponding Author:
Nicole M. Deterding, Institute for Research on Poverty, University of Wisconsin–Madison, 1180 Observatory Drive, Madison, WI 53706. USA.
Email: ndeterding@gmail.com

Keywords

Well into the twenty-first century, most qualitative research training is still either consciously or unconsciously based on grounded theory—a model designed in the 1960s. Many books or articles based on in-depth qualitative interviews begin the methodological section with a citation to this classic approach. Grounded theory, developed by Glaser and Strauss (1967) and elaborated by Glaser (1992), Strauss (1987), Strauss and Corbin (1990), and Charmaz (2000), provides a set of steps for conducting and analyzing qualitative research. Although often cited, a true grounded theory approach is less common among sociologists doing interview studies today. Its central prescriptions—theoretical sampling toward saturation, strongly inductive analysis, and full immersion in the research field—bear little resemblance to the actual methods used by many large-scale interview researchers. And yet, grounded theory continues to have an enormous influence on how qualitative research design and interview coding are taught in graduate programs. How should twenty-first-century interview researchers proceed?

In this article, we argue that the coding procedures emanating from grounded theory were limited by the technology available to researchers at the time: paper, scissors, index cards, and colored pens. In a path-dependent process, open descriptive coding aggregating to conceptual abstraction shaped the features of computer assisted qualitative data analysis (QDA) software. Despite the fact that electronic documents can be flexibly stored and snippets of text easily cross-referenced and retrieved, the result is that the procedures outlined by Glaser and Strauss were turned into algorithms for how to do qualitative research. Indeed, most sociologists reporting the use of QDA software in their published work appear to do little more than apply virtual sticky notes and sort piles of electronic note cards (White, Judd, and Poliandri 2012).

Reliance on the twentieth-century approach poses a number of problems for today's researchers. First, most researchers have many theoretical ideas and concepts they will apply to a single set of data. Codes that work well for one chapter of a book or dissertation are not necessarily the ones a scholar wants for a different substantive chapter or article, and grounded theory

coding does not easily allow for flexible reanalysis. Second, coding line by line takes a great deal of time and effort before one establishes a set of codes that can be applied to the entire set of data; establishing the reliability and validity of coding is a different challenge when using software over hard-copy coding. Third, the grounded theory approach was developed based on projects with a relatively small number of interviews, generally conducted, and analyzed by the researcher himself or herself. Increasingly, qualitative studies involve large numbers of interviews, often numbering near 100. While reliably and validly applying thematic codes across 80–100 interviews is a logistical problem for even a single researcher, today's large-N studies often frequently involve teams of people who interview, code, and write separate papers based on a shared pool of material.

Finally, structuring data using many small codes does not easily facilitate analytic transparency or secondary analysis by researchers not involved in the initial data collection. More and more, qualitative researchers are exhorted to clearly communicate the logical steps in their data analysis, yet conventions for doing so have yet to appear. Relatedly, norms of open science—such as data archiving and secondary analysis—that are taking hold in quantitative social science have largely yet to make it to qualitative research. While secondary analysis of interview data is an opportunity that is rarely taken advantage of today, we believe it should be encouraged. Other advances in technology—such as secure servers—enable researchers with institutional review board (IRB) permission to analyze existing qualitative data, even if the researcher may not be at the same institution as the data. However, to date, there is little methodological guidance on how to plan for or undertake secondary analysis.

In this article, we briefly describe the assumptions involved in the grounded theory approach to coding and analysis. Next, we analyze the methodology sections of in-depth interview studies in American Sociological Association (ASA) journals to highlight their mismatch with current conventions for semistructured interview research in sociology. We then propose a set of procedures—which we call *flexible coding*—that flips the script to take advantage of modern QDA technology. Rather than limit ourselves to how most qualitative interviewers are taught to code or to how beginning qualitative researchers think they *ought* to approach the craft, our goal is to better reflect how one can practically go about analyzing large-scale interview data. We end by weighing the strengths and limitations of a twenty-first-century approach to qualitative analysis compared to the previous approaches.

Background

Grounded Theory: Origins and Approach

In 1967, two sociologists, Barney G. Glaser and Anselm L. Strauss, published *The Discovery of Grounded Theory: Strategies for Qualitative Research*. Building on Znaniecki's (1934) "analytic induction," their book promoted a systematic, inductive approach to qualitative research, suggesting qualitative researchers should abstract conceptual relationships from data rather than deduce testable hypotheses from existing theory. After publication, Glaser and Strauss came to disagree about central features of the method and parted ways. They each have been active since (Strauss until his death in 1994), publishing competing guides to grounded theory (Glaser 1998, 2005; Strauss 1987; Strauss and Corbin 1990).

Much ink has been spilled explicating their variations on a theme, but the primary divergence is that Glaser stresses induction as the core of the approach, ultimately going so far as to advocate that researchers avoid any literature relevant to the subject being studied until after the interviews are complete and initial coding of the data is done (Glaser 1998). While maintaining a focus on induction, Strauss became more concerned with validation and systematic procedure. Most modern variants of grounded theory favor Strauss over Glaser in their attention to the particular words of study respondents. Charmaz (2006), Bryant (2002), and Bryant and Charmaz (2007) built on Strauss, developing what they label "constructivist grounded theory." This approach stresses the coproduction and construction of concepts and interpretations by researchers and participants, recognizing their different positions, roles, backgrounds, and values.

There are most likely several reasons for the outsized influence of "grounded theory" in qualitative interview training. Glaser and Strauss offered an early attempt to systematically describe how qualitative research ought to be conducted. Their grounded theory offered a "scientific" prescription for what midcentury positivists had diagnosed as the biased, impressionistic, and anecdotal condition of qualitative research. The inductive approach begins with the data itself and exhorts the researcher to produce concepts and theory from it, promising theory generation rather than mere theory testing. Later, as broad questions of epistemological authority roiled the social sciences, the method was easily adapted to emphasize the categories of meaning offered by respondents themselves (Charmaz 2006). This combined practical and epistemological appeal remains even today. By providing step-by-step directions, the grounded theory approach can be taught to students, including applied researchers, regardless of their disciplinary

background. The approach also likely remains cited because most qualitative research has at least an element of induction. However, many scholars have speculated that researchers cite Glaser and Strauss merely to imply that they took an inductive approach.

Based on our informal discussions with contemporary researchers using large-scale interview data, it appears that few actually implement the unfolding data collection suggested by a grounded theory approach: theoretical sampling toward conceptual saturation. Practical demands of modern academic life, including adhering to the requirements of IRB, grant writing to secure research funding, balancing competing professional demands and multiple projects, working with research teams, and coordinating transcription of large samples all run contrary to the image of a researcher wholly immersed and spontaneously pursuing their interview project. This is one way that what interview researchers actually do departs from the methodological guidance.

Coding Interviews in Grounded Theory

Another departure between the methodological literature and everyday practice is the process of coding, which is our particular focus. Coding is the actual work of analyzing the interview data that have been collected, and it is rarely described in detail in publications. Often researchers will write that they "coded the data using grounded theory techniques," that "data were transcribed and coded," or that they "coded the data with ATLAS.ti". Coding is the most laborious and time-consuming part of interview research. Yet it is granted little space in published academic articles and books. It is not surprising, then, that coding is the most mysterious part of the research cycle for many beginning researchers. Glaser and Strauss outlined a procedure for coding that follows their inductive approach. Strauss and Corbin provide an even more detailed set of steps involving three major stages. Charmaz (2006, 2014) outlines the same three stages but uses different terminology. In all three models, coding begins by describing small parts of the data: lines, sentences, and even paragraphs or words.

In each of the approaches derived from grounded theory, the advice to researchers is clear: begin by generating many codes that reflect only the data. Later on, cull the list of codes by deleting some and combining others. When at all, it is only in late stages that the analyst should connect the data to previous research, including to the theories and concepts in the preexisting literature on the subject.

This approach to coding makes some sense when we imagine that the data were printed in hard copy; the codes that were applied were written in the margins of the transcripts; and the resulting categories were cut up into bits of paper, taped onto index cards, and then sorted into thematic piles. However, the widespread development of word processing in the early 1980s and the development of qualitative data analysis software soon after have given qualitative researchers new tools to do their research. It is unfortunate, however, that these tools have not led to a fundamental rethinking of how coding is actually performed. This is what we propose.

Data reduction is a fundamental part of qualitative analysis (Miles and Huberman 1994). When grounded theory was developed, chopping up the data into small pieces was a very time-consuming, physical process. After that came the stage of tossing aside material that was no longer needed and then combining the small pieces into larger codes. An example would be taking the pile of pieces of text labeled "attitudes about congressmen" and putting it together with a pile of text labeled "attitudes about mayors" and then labeling this new pile "attitudes about elected officials." The initial level of abstraction mattered deeply: If the researcher started by cutting up the transcripts into piles with broader categories—attitudes toward elected officials, for instance—when she decided to analyze mayors differently than congressmen, transcripts would need to be cut up again. It is easier when dealing with paper to sort codes and chunks of text in different ways to see how they come together, rather than to look at large chunks of text more broadly to determine how the data should be split. In short, the idea of starting with tiny bits of text and many codes and aggregating up made a lot more sense than starting with big chunks of text when researchers were doing it all by hand, with little piles of paper on their dining room tables. This is no longer required.

Epistemology of Grounded Theory

The second reason that grounded theory advises starting with small codes and aggregating is that Glaser and Strauss operated from an epistemology that almost pathologically advocated inductive research. Wacquant (2002) has colorfully characterized this approach as "an epistemological fairytale" (p. 1481). Others have less-colorfully noted that this is not how actual researchers work.

While other types of qualitative research—such as ethnography—may begin data collection with a broad research site rather than a set research question, the vast majority of interview researchers do not design their

interview protocols without connecting to previous literature on the topic. It would be absurd to invest all of the time and money in conducting an interview study without knowing whether it had already been done, what were the main findings, and what remaining theoretical puzzles and empirical gaps needed to be addressed. As such, sociologists who do interview studies typically know a great deal about their topics, even before entering the field. And for the most part, their interview schedules are structured or semistructured. The questions are open ended to be sure, but they generally follow a logical order designed to create a conversation, put respondents at ease, build trust, and importantly—focus the discussion on the researcher's questions, not just what the respondent feels like talking about. As a result, the questions that are asked in an in-depth interview reflect the researchers' hypotheses about the phenomena under study, the previous research that has been done on the subject, and the hunches or findings the researcher has learned as the research project has progressed.

While Glaser and Strauss (and Charmaz) stress the inductive nature of grounded theory to emphasize that researchers should learn from their respondents, allowing for surprising results and phenomena to emerge, contemporary qualitative sociology privileges cumulative theory building. Miles and Huberman (1994) developed a sourcebook of qualitative methods that allowed more theory-driven research, primarily stressing data display matrices as a way of advancing coding and analysis of transcripts. Timmermans and Tavory (2012) suggest that the best qualitative researchers are sensitized by the previous research early on; their projects are not wholly inductive. At the same time, one should remain very open to surprising or unexpected findings; projects are also not solely deductive. They define this approach as *abductive*, suggesting good qualitative researchers adopt:

> [a] qualitative data analysis approach aimed at theory construction. This approach rests on the cultivation of anomalous and surprising empirical findings against a background of multiple existing sociological theories and through systematic methodological analysis. As such, it requires a fundamental rethinking of core ideas associated with grounded theory, specifically the role of existing theories in qualitative data analysis and the relationship between methodology and theory generation. (p. 169)

We believe this description more accurately reflects what many sociologists conducting in-depth interview studies aim to do. Yet, while Timmermans and Tavory have proposed a useful epistemological substitute for grounded theory, they have not provided advice about how the actual process

of coding could support their recommended move away from grounded theory suppositions.

Enter QDA Software

When QDA software was developed in the 1980s, software developers followed the only accepted guidelines for qualitative analysis in existence—grounded theory. Thus, the many different software packages reflect these historical roots. The software allows researchers to code line by line, to write memos while coding, and to combine codes into broader more abstract codes. Most packages also produce visual models that relate the codes to build a conceptual model. Weiss (1994) describes the low-tech ways in which qualitative researchers developed these visual models for data reduction before QDA:

> Many researchers find visual display of the elements of their story a valuable means of achieving both local integration and inclusive integration. Miles and Huberman recommend diagrams on paper, with lines linking related issues, to display graphically the conceptual framework of the final report. Becker suggests putting data and memos about the data on file cards that can then be spread on a large flat surface and arranged and rearranged until they achieve a logical sequence. Agar suggests finding an empty classroom full of blackboards on which can be drawn maps of concepts and their interrelations. (p. 162).

Slowly, however, QDA software packages have developed into more powerful and versatile tools that reflect their early origins but also better support researchers in what they actually do when they analyze data. We argue below that the best use of these tools for coding data is exactly the opposite from the steps outlined by the grounded theorists. Researchers should get to know their data by indexing transcripts with broad codes that reflect the questions they asked in their interviews and the concepts they sought to examine as they went into the field. By writing analytic memos during this process, they can generate conceptual themes that appear across cases. Then, capitalizing on the existing index for data reduction, they can apply more fine-grained codes to subsections of the interviews. Finally, analytic coding can be examined across respondent attributes to document the depth of textual evidence for the claims about key relationships the analyst makes. We believe this method of coding can facilitate reliability, validity, and transparency; allows the researcher to capitalize on features of the software beyond the simple retrieval of quotes; and will provide better

opportunities for team work, complex projects, secondary analysis, and replication studies.

The State of the Field

We came to our recommendations out of necessity. As a graduate student, Deterding joined Waters's in-progress study of low-income parents' recovery following 2005's Hurricane Katrina, the Resilience in Survivors of Katrina (RISK) project (www.riskproject.org), leading a team of graduate students in coding the interview data. RISK includes four waves of longitudinal survey data ($N = 780$) and three rounds of life history interviews with a subset of survey respondents ($N = 125$ interviews; 30 respondents were interviewed twice). The project was overseen by a multidisciplinary team of principal investigators (sociology, psychology, and economics), and the data needed to be accessible to researchers across three universities. Because of the mandates of Federal funding sources—and the historical importance of the topic—data archiving for secondary analysis was a concern from the start of the project (Waters 2016). While the RISK project may be of unusual size and scope, including the opportunity to match survey responses to interview transcripts (Deterding 2015a; Morris and Deterding 2016), many of the challenges we faced are common to large-scale interview studies.

Before the RISK study, Waters had conducted four other increasingly large qualitative interview projects. Her first project, a study of ethnic identity, was based on 60 interviews and the analysis was conducted with typed transcripts, scissors, and index cards (Waters 1990). A second project included 120 in-depth interviews on the topic of West Indian immigrant identity and was analyzed using word processing software (Waters 1999). In the early 2000s, Waters codirected a large study of second-generation young adults in New York City that included 333 in-depth interviews and was analyzed using an early version of ATLAS.ti (Kasinitz et al. 2008), then in 2011, she codirected a study of young adulthood in New York, Iowa, San Diego, and Minneapolis based on 437 life history interviews. This project was also analyzed using ATLAS.ti and involved a small army of researchers (Waters et al. 2011). In each case, the analysis of interviews followed a very different logic and flow than that suggested by grounded theory.

Current Conventions in Sociology

It is not only our own work that produces large volumes of interview data. To document broader disciplinary convention in U.S. sociology, we compiled a data set of all interview-based articles published in the two flagship journals

of the discipline (*American Sociological Review* and the *American Journal of Sociology*) and three ASA-sponsored subfield journals (*Journal of Health and Social Behavior*, *Sociology of Education*, and *Social Psychology Quarterly*) between January 2010 and December 2015. These pieces are listed in Online Appendix (which can be found at http ://smr.sagepub.com/supplemental/). While noting that many interview-based studies are published as books and that specialty qualitative journals and regional or subfield journals regularly publish interview-based studies, we suggest these leading journals reflect what is rewarded in the mainstream of the discipline, particularly by general audiences.

The goal of this analysis was to assess the accuracy of our claims about current disciplinary convention. For each article, we recorded the journal, year, author, title, number of interviews, any additional modes of data collection, and the authors' textual descriptions of the procedure they followed for data coding and analysis. In total, we identified 98 articles that included semistructured interviews as a data source. Analysis of these articles confirms that twenty-first-century qualitative researchers generally conduct studies with large numbers of interviews, are very likely to use mixed-methods approaches combining interviews and other data sources, provide very little information on how they coded their data, and nevertheless continue to cite or gesture toward grounded theory as their methodology.

Large Ns

The main consensus among interview methodologists regarding how many interviews a researcher should plan is "it depends" (Baker and Edwards 2012). Yet we hypothesized that the typical number of interviews in sociological studies has expanded far beyond what would be required for a grounded theory threshold of conceptual "saturation" (Glaser and Strauss 1967; for an empirical test suggesting the number may be as low as 12, see Guest, Bunce, and Johnson 2006). Exactly how much does practice diverge from what is recommended by this benchmark of grounded theory?

Table 1 reports information on the number of studies including semistructured interviews by journal. The minimum, median, and maximum number of interviews is reported. Overall, only 19 articles (19.4 percent) were based solely on interview data. Consistent with the idea that that a single data collection often yields multiple analyses, several studies appeared in more than one publication. One study was represented three times (Calarco 2011, 2014a, 2014b), and five were represented twice (Ispa Landa, Rivera, Teeger, Turco, and Wilkins). As far as could be ascertained from the methodology

Table 1. Characteristics of American Sociological Association–Sponsored Journal Articles Reporting Semistructured Interviews (2010–2015).

	Studies		N Interviews[a]		
Journal	All	Interviews Only	Min. (interview only)	Median	Max.
American Journal of Sociology (AJS)	29	4	36 (50)	85	208
American Sociological Review (ASR)	28	5	12 (71)	55	170
Journal of Health and Social Behavior (JHSB)	7	1	18 (46)	46	137
Social Psychology Quarterly (SPQ)	15	5	17 (25)	35	189
Sociology of Education (SoE)	19	4	12 (54)	53	170
Total	98	19	12 (25)	55	208

[a]N interviews excludes three studies for which the number of interviews analyzed was unclear: ASR (0), AJS (2), JHSB (0), SoE (0), and SPQ (1). These were historical case studies, ethnographic fieldwork that included a semistructured interview component, or repeated interviews within a stated number of respondents.

discussions in the articles, only three of the studies (Brown 2013; Collett, Vercel, and Boykin 2015; Deterding 2015a) included secondary analysis of semistructured interview data.

While qualitative methodologists will rarely state a hard cutoff for the number of required interviews, these data demonstrate that large studies end up published in the core disciplinary journals. The number of interviews ranged from 12 to 208, with only 19 studies containing fewer than 30 interviews. The median number for the whole set is 55, and interview-only studies generally had larger samples than studies that combined data sources. One in four articles (24 total) reported on 100 or more interviews. Clearly, a substantial portion of contemporary qualitative researchers face a large amount of interview data to handle during analysis.

Opaque Coding

Table 2 reports information coded from authors' descriptions of their coding process. By and large, the type of information included in descriptions of the coding process is not standardized, either within or across journals. The most commonly cited methodologists were the grounded theorists and their successors: Charmaz, Glaser and Strauss, and Miles and Huberman. More than half of the articles (55 percent) did not cite a specific methodological text, instead using terms that are drawn from these authors: "inductive,"

Table 2. Descriptions of Coding/Analysis in Studies Using Semistructured Interview Data (2010–2015).

Journal	All Studies N	No Methodologist Cited		Describes Coding Procedure		Mentions QDAS	
		N	Percent	N	Percent	N	Percent
American Journal of Sociology[a]	29	21	72.4	20	68.9	9	42.8
American Sociological Review	28	16	57.1	23	82.1	11	39.2
Journal of Health and Social Behavior	7	4	57.1	7	100.0	4	57.1
Social Psychology Quarterly	15	7	46.7	13	86.7	4	26.7
Sociology of Education	19	7	36.8	18	94.7	11	57.9
Total	98	55	55.1	61	82.6	30	39.7

[a]In *American Journal of Sociology* several studies used in-depth interviews as part of a historical case method approach. None of these mentioned coding, but it's a different method of analysis.

"emergent," "open, "axial," "focused," or "thematic." A handful of studies adopted particular approaches such as "frame analysis," "narrative analysis," or "semiotic techniques" or reported drawing their coding categories from prior literature. Only a minority of articles (40 percent) explicitly mentioned use of QDA software (typically NVivo or ATLAS.ti). Nearly, 20 percent of articles reporting semistructured interview data did not discuss their coding procedure at all.

Why So Large?

We'd briefly like to speculate on why sociological interview projects are typically so large. Given that contemporary sociology privileges describing mechanisms, many sociologists today design their work to highlight contrasts between groups of respondents or research sites. By designing a study across hypothesized salient differences, scholars are able to construct arguments that illuminate the relationship between context and concept. This approach requires enough respondents in each "cell" to establish patterns of difference by group or site. Studies designed this way produce large sets of textual data, which presents logistical challenges for the researcher during the analysis phase. We believe studies examining the contours of group difference are particularly well suited to the coding procedure we outline below.

Flexible Coding: Outlining Twenty-first-century Analysis

We describe a method of "flexible coding" that is better suited than grounded theory to the realities of analyzing in-depth interviews with QDA software. While emerging methods push computerized analysis further, including automated analysis of textual data (Bail 2016; Chakrabarti and Frye 2017), we do not formally incorporate quantitative text analysis here.

Our techniques, we believe, may not be entirely new to many seasoned researchers, as the process reflects both what we discovered as useful for ourselves and, loosely, what many peers have told us that they do. Our goal in outlining the method is to bring the craft of twenty-first-century interview coding into the light, reflecting how sociologists with large interview samples can set themselves up for rigorous, flexible analysis.

Assumptions of Our Approach

While there is no shortage of how-to guides for popular QDA software packages, they largely sidestep disciplinary epistemologies in favor of broad applicability to applied research settings (e.g., Bazeley and Jackson 2013). As demonstrated by the analysis of published articles above, this work has not produced a common language or set of conventions for sociologists.

We take as our starting point that the arguments qualitative sociologists make should be soundly supported by the data at their disposal and that the published research product should transparently reflect that. Other assumptions derive from common features of empirical sociology based on in-depth interviews:

- A semistructured interview protocol with a relatively large number of interviews ($N > 30$).
- Some combination of induction and literature- or theory-based coding; research that is not completely inductive, even in the first steps of analysis.
- Comfort with the analytic process of relating variables (independent/ dependent) to one another.

In other words, we start from the premise of an empirical qualitative sociology that is in dialogue with existing theory and findings from previous studies, including quantitative research. It may be the case that *a priori* categories actually have no importance to respondents, are not relevant to the research setting, or are not the main factor driving the phenomenon we

are trying to explain. Evidence for such an argument is produced by systematically examining the text against these categorizations. Our approach may not be well suited to scholars who completely reject variable-based empirical work.

Other scholars have devoted substantial energy to establishing contemporary definitions of "rigor" in the design and collection phases of qualitative projects, including two National Science Foundation workshops (Lamont and White 2009; Ragin, Nagel, and White 2004). There has been no similar update for the craft of qualitative data *analysis*. We focus below on specific steps to help researchers organize data and develop an argument once the interviews have been conducted and transcribed. It is beyond the scope of this piece to delve into ongoing conflicts among sociologists over the epistemological limits of interview research (see *Sociological Methods & Research* Forum, Jerolmack and Khan 2014, and responses). Finally, analysis based on a small number of interviews or using highly unstructured protocols (such as phenomenological interviewing) are probably not well suited to these methods. When there are very few interviews or researchers have a narrow scope to their analysis, it might not make sense to make deep use of QDA, as the investment of time and money will likely not yield much beyond what one can do using word processing documents or paper and pencil to find and retrieve data.

Given these parameters, what is a twenty-first-century approach to qualitative analysis? At minimum, we believe that researchers should be able to communicate the logical steps underpinning their argument and report these as they write up their study findings. How did they generate and operationalize their concepts? How did they verify the conceptual relationships they propose? Did they attempt to rule out alternative explanations or explain negative cases? The answers to these questions should be included in any discussion of how a researcher reaches a conclusion in published work. It is now rarely if ever discussed. The potential of QDA software to aid these tasks remains largely untapped, at least based on what is typically reported in the Methods sections of books or peer-reviewed articles.

A Note on Choosing QDA Software

QDA technology is rapidly evolving. The computer-assisted QDA networking project in the United Kingdom (http://caqdas.soc.surrey.ac.uk) is an excellent—and regularly updated—source for comparable reviews of and guidance on choosing QDA software. In 1995, they listed 24 QDA packages supporting a variety of specialized approaches to analyzing qualitative data

(Weitzman and Miles 1995). As of this writing, the site lists 10. Common tools across the set of programs include the ability to write and track memos; index or code data with thematic or conceptual labels; add demographic or other categorical information to compare subgroups; run searches or queries; develop visual models or charts; and generate reports or output from the data (Lewins and Silver 2007). That major software options share these features is evidence of the fact that, over time, QDA software has "simultaneously become more comprehensive, more applicable to a diverse range of methodologies, and more homogenous" (Bazeley and Jackson 2013:6). We elaborate our approach using NVivo Version 10, though we have substantial experience with several iterations of ATLAS.ti and some experience with the first version of Dedoose. We are confident that a similar approach can be used with these programs. Any software package with the major capabilities above should be able to facilitate our approach to organizing and analyzing interview data. Based on our analysis of published in-depth interview studies appearing in ASA journals above, ATLAS.ti and NVivo appear to be the most commonly used among sociologists.

QDA for In-depth Interviews

Below, we discuss key considerations for designing a QDA database and a three-step process for flexible coding and analysis. Codes are of three types—attributes, index codes, and analytic codes. After applying these codes, it is possible to use the software to test and document the key relationships in the data.

   We suggest that analysis begins with getting a handle on the big picture(s) in the data. Generally, our first step can be thought of as data exploration and preparation. It involves *indexing* the transcripts, anchoring content to the interview protocol. During this phase, the researcher will also produce respondent-level and cross-case memos, beginning to document the analytic process by developing hypothesized relationships between concepts. In stage 2, the researcher will use the index for data reduction, applying *analytic codes* to focused sections of the transcript, prioritizing reliability and validity of the coding. Analytic codes represent the concepts to explore in a single paper or book chapter and integrate emergent findings with what is known from the literature. In stage 3, the researcher will use the software's tools for conceptual validation, model building, and the testing and refinement of the data-based theory.

   In our recent work, we have used this process for organizing qualitative analysis with a research team, which included scholars from different

disciplines writing about many separate topics. The RISK qualitative data have been used to examine physical and mental health outcomes of Katrina (Bosick 2015; Lowe, Rhodes, and Waters 2015; Morris and Deterding 2016); experiences of racism during the hurricane and its aftermath (Lowe, Lustig, and Marrow 2011); changes in marital and partner relationships (Lowe, Rhodes, and Scoglio 2012); residential choices and social mobility (Asad 2015); posthurricane (im)migration and race relations (Tollette 2013); and educational planning and return (Deterding 2015a). Other methodological treatments of team-based coding focus on the intercoder reliability of analytic codes in a single study, which is noted as a very time-intensive iterative process (Campbell et al. 2013; Price and Smith 2017). We present an alternative model for teamwork in qualitative analysis. Because our initial "indexing" step is broad rather than fine-grained, the task can be more easily distributed among members of a research team than can line-by-line abstraction. Once the index is established, either an individual analyst or a research team can proceed to the analytic stage, using the software's capacity for data reduction to enhance the reliability and validity of analytic codes. These steps are further discussed below.

Basic Organization: Transcription and Database Design

To effectively use QDA technology, first collect all of the source materials and design the database that will house them. Setting up for flexible analysis requires importing transcripts and any related materials (audio recordings; postinterview field notes or memos). It also includes connecting these documents to *attributes* or the conceptual categories that guided the research design.

Attention to the particularities of QDA analysis before and during transcription can save a lot of time. Some basic organization will make life easier when dealing with a large number of interviews, whether or not transcription is done by the researcher(s). For instance, it is a good idea to institute uniform naming conventions of files. If documents are named with respondent ID numbers (e.g., "001-Transcript" for the first respondent's transcript), many software programs will import the document name as an anchor for attaching respondent-level attributes. This automation will save a lot of time and clicking if respondents are the unit of analysis. Using respondent ID or a pseudonym instead of "respondent" in the body of the transcript will make it easier to identify excerpted text during data analysis. And if the project has multiple interviewers, we recommend using the interviewer initials in the transcript. This will also allow the researcher to know who is talking when

dealing with reduced data and facilitate an examination of interviewer effects (see Lowe et al. 2011).

If the researcher(s) will transcribe the interviews, it is possible do so from within the QDA program. In NVivo, there is a transcribing function that allows audio replay, setting the speed, and pausing and rewinding, much as one would use a transcribing machine. This is helpful because some of the very best ideas about what the data mean can arise in the middle of the drudgery of transcribing. Transcribing within the program enables synchronizing audio or video with the transcription in order to easily revisit the audio while reading the transcript. It may be helpful to ask questions such as: What was the respondent's tone of voice when they said this quote? Were they laughing, being sarcastic, or crying? Sounding strong or weak? While a deep discussion about the value of revisiting audio is beyond our scope here, the actual voices of respondents can be helpful for the duration of the analysis if the challenge of locating the appropriate section is overcome. If transcription is outsourced, it may be worth paying to include periodic time stamps in the transcripts.

Interviewers may have written field notes immediately after conducting the interview. These documents should be imported into the database and linked to the respondent so that they can easily be accessed; they represent the beginning of respondent-level memos. If the researcher(s) do the transcribing, it's a good idea to add to these memos by inserting additional thoughts about the interview case at the moment they occur and linking these memo notes to the appropriate part of the transcript.

Finally, beginning to link documents to *attributes* is a fundamental part of QDA database setup. Attributes are the salient personal characteristics of the interviewees that played a role in the study design. These may be demographic variables such as age, gender, race, occupation, socioeconomic status, or specific contextual data such as experimental group or control group, state, or neighborhood of residence. To use the language of variables, these are the demographic and structural independent variables that were posited to shape the qualitative topic of the study. For example, in the New York Second-generation Study, Waters and colleagues sampled second-generation young adults whose parents had immigrated from five sending areas—China, Dominican Republic, South America, West Indies, and the former Soviet Union, along with young adults with native-born parents who were white, black, and Puerto Rican. These ethnic and racial origins were assigned as attribute codes to each respondent and later used in analyses that examined different conceptions of success in life. In this particular case, ethnic origin was the independent variable (and an attribute code attached

to each individual) and attitudes toward success (an analytic code applied to the text later) was the dependent variable (Kasinitz et al. 2008).

In mixed-methods data, attributes can include person-level data from respondent screening sheets, demographic information sheets, or surveys. For instance, using the RISK data, we connected longitudinal survey responses to transcripts using NVivo Version 10 "classification sheets," allowing us to describe qualitative mechanisms for mental health differences among survey respondents with proximal and distant social networks (Morris and Deterding 2016). Attributes may not be limited to person-level characteristics; other units of analysis are possible. For instance, if the project has multiple research sites, "site" can be designated as an attribute, allowing the analyst to query the transcripts and memos to examine thematic differences between sites. If this information is not available in a demographic information form, the researcher will need to record respondent attributes when reading the interview text and applying index codes (discussed below).

Why is it important to connect transcripts with attributes? QDA's querying capabilities rely on the *intersection* of codes, and attributes are codes that are applied to the *entire transcript*. Attributes are applied by linking documents to a classification sheet (NVivo version 10), descriptors (Dedoose), or a primary document family (ATLAS.ti). In each of these software options, documents can be assigned attributes manually from within the software. However, with more than a handful of respondents, attributes are more quickly and reliably imported via a spreadsheet that includes the respondent ID. Because of this, we recommend recording attributes for all of the respondents in a spreadsheet and then importing this to the database. The work of identifying attributes can be done while sampling and interviewing is ongoing or at any point afterward. Although it is likely that other important conceptual categories warranting inclusion as an attribute will arise during analysis, identifying and coding initial respondent attributes is an important part of early data preparation. Querying the intersection of attributes and analytic codes will reappear in the third stage of the data analysis, when testing the robustness of the theoretical claims.

Stage 1—The Big Picture: Indexing and Memos

Our formal analytic procedure begins once the interview transcripts are complete and the database is set up. How does one begin to apply codes to what may be hundreds or even thousands of pages of text? We believe that early reads of the transcripts play an important role in generating concepts and theories—identifying the main "stories" in the data. From conducting the

interviews, researchers may have a provisional idea of emergent themes across them. They may also want to explore relationships hypothesized by prior literature. At the beginning of the reading, however, these concepts likely will not be refined enough to apply analytic codes across a large number of interviews with any degree of reliability. This will be especially the case if one is part of a qualitative research team with multiple interviewers and coders, though it is likely true even if a single researcher wrote detailed memos in the field or during the transcription process. Coding reliability is of central importance to responsible use of QDA software.

Textual coding should begin by applying *index codes* to the text, building out respondent memos, and beginning cross-case conceptual memos. The inverse of line-by-line coding, *index codes* represent large chunks of text, enabling data reduction and retrieval as the analyst proceeds through constructing and documenting their argument. Setting the data up this way allows subsequent rounds of reading to be more focused and analytic coding to be more reliable. A logical starting place for designing the index is the interview protocol. Include a code for each question on the structured or semistructured interview schedule. If the interview protocol is organized with questions inside of broader topics, it is possible to aggregate question codes to the topic level as well. While most sociological interviews are semistructured, if interviews are very structured, it is possible to take advantage of the MS Word subheading structure to label each question as a new subheading. Then, when the documents are imported into NVivo, the program can autocode the text, applying the question label to the text that immediately follows.

In addition to helping the analyst become familiar with the data through a deep reading of the transcript, indexing takes advantage of the transcripts' natural organization to enable easy text location and retrieval. In a life history interview, for example, the protocol may begin by asking about childhood, then neighborhood, and then schools; each section may have several questions or prompts. The index would have "childhood" as the major heading and would include answers to several specific questions in the protocol, each with their own code. The answers to the question "Tell me about the neighborhood you grew up in?" would receive the index code "childhood-neighborhood"; "Who did you live with when you were growing up?" would receive the index code "childhood-household." Combining both would create a broad "childhood" code.

Given that most sociological interviews are only semistructured, the task of indexing is not as straightforward as it may first seem. To preserve conversational flow, the interviewer likely did not ask again questions that were

answered in the natural course of the conversation. Software features such as NVivo's "matrix coding query" or ATLAS.ti's "code-by-document matrix" are extremely helpful for making sure that material for index codes is captured completely. These tools create a chart of all codes and transcripts, showing which transcripts appear to be missing information. If, after the first pass at indexing, it appears that a respondent has not answered a question in the protocol, it is time to reread to make sure the answer was not simply overlooked when naturally intertwined in the conversation.

Because it is based on the interview protocol, indexing represents coding for the broad topics that were pursued in the research. In our study of Hurricane Katrina survivors, index codes included topics such as "evacuation experiences" and "physical and mental health" (Asad 2015; Waters 2016). A study of immigration topics might include "migration experiences," "naturalization," and "American identity." These large topics likely include pages of text spanning several different questions or even different points in a given interview. The goal is to locate and link together answers to broad content areas wherever these topics appeared during the interview.

While identifying respondent attributes and reading the text for indexing, the researcher will begin to develop ideas about the transcripts. We agree with Small (Lamont and White 2009:169) that it helps to think of qualitative interviews as a series of case studies. In reading each case, the researcher will develop an idea of the important concepts and their linkages in the data—provisional answers to the "how" and "why" questions at the center of the research. These can be documented in respondent-level memos, which we recommend writing for each interview as it is read and indexed. Whether respondent memos begin immediately after conducting the interview or while one analyzes cases upon completion of data transcription, cross-case analysis of respondent memos will produce several ideas about "the story" in the data. When passing through multiple cases in the first round of reading and coding, we recommend compiling a list of concepts and relationships between them that appear to describe multiple cases and begin describing the contours of relationships in thematic memos. This is the beginning of cross-case analysis, when we recommend starting to flesh out the analytic codes to apply in stage 2.

Great quote and "aha". Throughout all stages of the coding process, researchers should take care to note chunks of text where respondents are particularly concise, articulate, or poignant. Include or make a separate code for snippets of text that trigger "aha" moments in understanding the data so that these are easily retrieved later. When writing, queries of the overlap of "great quote" or "aha" with analytic codes will identify quotes to include in the paper.

Our recommended first stage is in direct contrast to the grounded theory approach, which would begin with line-by-line coding. Based on our own and others' experiences, we have concluded that using the software to apply conceptual abstraction to the text is ill-advised at such an early stage. The benefit of QDA software is that it is easy to apply as many codes as one would like; the challenge of software is that it allows far more codes than is either useful or reliable. Line-by-line coding requires much time is later spent on aggregation, and coding this way produces a single story in the data, making reanalysis difficult. This is why we suggest that the first read of the text be used for indexing the data and developing contours of the concepts in thematic memos; the themes and theories are not yet ready to be applied to text in a reliable or valid way, and we do not recommend limiting analytic options too early.

To allow for maximum flexibility, it is important to begin a list of analytic codes—and their definitions—as ideas and insights occur during indexing. However, it is best to wait to apply them to the data. Valid and reliable coding is necessary for taking full advantage of the data (and the power of QDA software) in later stages of analysis. The second, more focused, reading is when we recommend applying analytic codes one research question or paper at a time.

The process of indexing transcripts and applying attributes may seem time-consuming, but it is time well spent. In contrast to the unwieldy piles of text snippets created by open coding, after this stage is complete, the data are ready for use in several different thematic projects. The data set will also be ready to share among research team members or with researchers who may be interested in using the data for secondary analysis. If the research funder requires that transcript data are available to others, sharing an indexed data file with respondent attributes will meet this standard—and increase accessibility—without requiring additional work. Team members and secondary analysts can apply their own analytic codes to suit their own research questions and goals. In other words, we recommend producing a version of the coded project containing only attribute and index codes. This version should be archived for secondary users and distributed to the research team. Then, each researcher can apply their own analytic codes as they analyze the data.

Stage 2: Applying Analytic Codes

After a researcher or research team goes through the process of indexing transcripts and writing respondent and cross-case memos, there will be

several ideas that could be pursued in many papers or book chapters. The list will include, but not be limited to, the original research questions that informed the study; some themes will be truly "emergent." The work done during respondent and cross-case memoing will offer a variety of possible directions for the first paper from this project. It is very common for large qualitative projects to unfold over time and result in a range of products, beginning with journal articles and culminating in a book. Being strategic about the analytic process can help researchers meet very real publication pressures. Also, to avoid being overwhelmed by possibilities, *we suggest approaching the application of analytic codes one research question or paper at a time*. It is not necessary to write all of the papers at once! The familiarity with the transcripts built during the first reading means researchers will have a good idea where to find the relevant chunks of the transcript for a single research question.

A major problem of analyzing a large interview data set is applying codes in a reliable manner (Campbell et al. 2013). While sometimes this issue is solved by coding in teams, it is possible to use the software to aid the process. On the second reading, we suggest limiting reading to the relevant text only, considerably reducing the task of applying analytic codes. We also recommend ignoring respondent attributes while applying the analytic codes. Only after coding thematically across all transcripts should the researcher examine whether there are patterns of qualitative difference by attributes. This technique allows the analyst to avoid confirmation bias, keeping the final argument as close to the text as possible.

Use the *index code* to display the relevant sections of the transcripts and apply only one or two analytic codes at a time to this text. By focusing the analytic process in this way, it is possible to increase the reliability and validity of coding. For example, Deterding (2015a) built concepts of "instrumental education" and "expressive education" in conceptual memos during her initial read of respondents' discussion of their college plans. Using the index, she was then able to apply instrumental/expressive codes to text in 127 transcripts in about 10 hours. By limiting herself to the code indexed at "education history" and "successful adulthood," her second read covered approximately 20 percent of the full transcripts, a piece of information she reported in her methodology section. The indexing reading of the 120 transcripts took a group of graduate student coders about 250 hours plus time for cleanup and matrix checking, and it would be nearly impossible to reliably apply well-defined analytic codes over such a long period of time.

In addition to the *a priori* attributes discussed above, some analytic codes should be applied to the entire interview, becoming attributes. This is

especially true if a typology is used to organize the data. A typology is a way of generalizing from concrete cases by defining a common core within a set of cases (Weiss 1994:173). This common core defines the specific way in which the cases cluster together. A typology is not a theory, but rather a way of organizing data as a step toward producing a theory.

For example, Deterding (2015b) read the reduced interview excerpts, identifying instrumental and expressive logic toward education as they appeared in the text. At the end of each case, she made a judgment about whether the *person* should be typologized as instrumental, expressive, or mixed based on the textual evidence and added this to the attribute file. Together, the analytic and attribute codes marked the transcript with textual evidence for her person-level typology. Similarly, Waters (1990) constructed a typology of racial and ethnic identity among second-generation West Indian teens. She coded each respondent based on their responses to many different questions as (1) identifying as African American, (2) identifying as ethnic American (Jamaican American or Trinidadian American), or (3) immigrant identified (identifying as Jamaican or Trinidadian). She conducted this study before she began to use QDA software, but if she had been using the software, these designations would have been applied to the entire transcript via Primary Document (PD) families in ATLAS.ti or a classification sheet in NVivo to help her understand the relationship between ethnic identity and lived experiences in the United States.

Analytic codes may also arise from the literature. Sometimes, qualitative researchers seek to apply concepts from previous research to a new study population. Here, reliability and validity are also very important, if qualitative data are to be used to explicitly test theoretical concepts derived by others. Reducing the transcripts to the appropriately indexed information, this task becomes much less unwieldy.

Stage 3: Exploring Coding Validity, Testing, and Refining Theory

In the end, researchers using the flexible coding process aim to construct an account of the data that meets the threshold of *theoretical validity* (Maxwell 1992). A theoretically valid explanation is an "abstract account that proposes to explain what has been observed," where concepts and their relationships have a strong basis in the data (Silbey 2009:81). Without a clear procedure for validating that the argued relationships are truly grounded in the data, interview researchers risk accusations that their work is not rigorous. During respondent-level and cross-case memoing, flexible analysts built hunches about the important stories in the data. Next they applied analytic codes across

the body of data. Now it is time to explore how deeply the story is grounded in the entire body of text. Software can aid this process, by helping researchers identify trends across cases, investigate alternative explanations, and quickly locate negative cases that help refine or limit the theoretical explanation.

QDA software also makes it relatively simple to examine the cross-case *reliability* of the thematic coding. While other authors have suggested options for enhancing reliability that involve multiple coders (see Campbell et al. 2013; Price and Smith 2017), an alternate option is to query the intersection of the typology (stored as an attribute) and analytic codes. To continue the example above, for each person-level categorization (instrumental/expressive/mixed), Deterding output the analytic codes for instrumental and expressive logic in order to make sure that the textual evidence identified groups that were truly distinct. The process of reducing data down from full transcripts, to indexed extracts, and finally to grouped analytic codes allowed her to judge whether she had applied uniform qualitative criteria across the sample, increasing reliability or *construct validity*. When looking at the data in this organized, reduced form, some respondents seemed misclassified. She then revised their classification, assuring the construct validity of her typology.

Other features of the software can help researchers test and refine the theoretical explanations they have developed. There is considerable debate over methods for determining what counts as a robust finding in qualitative research. We do not believe it is necessary for a phenomenon to apply to the entire sample to be analytically important. However, a systematic treatment of alternative explanations and negative cases is an important part of contextualizing findings and creating a convincing theory. The intuition is that it is possible to learn about the scope of the theory and refine an understanding of important relationships by examining (and interpreting) where it does not appear to apply. Blee (2009:148) sets out the following criteria for a qualitative analytical plan, arguing that it should take into account "how will data be assessed to ensure that (1) all data are considered (2) spectacular/extraordinary events are not overly stressed (3) data that diverge from the pattern are not discounted without a clear rationale to do so." Querying the data with QDA software can aid in this process.

While the easy production of frequency tables is a useful feature of QDA software, taking advantage of software does not require a frequentist perspective. If one approached analysis from a case-based perspective, a single disconfirming case or cluster of exceptions may crystalize the conceptual limitations of the trend or help refine the working theory to account for the exceptions. From this perspective, it is not the number of exceptions to the

theme that is analytically important but how the exceptions help to refine the theory. The data querying capacity of QDA software allows one to easily identify cases that are exceptions to trends and require further examination, meeting a typical analytical requirement in the methods literature that negative cases should be explicitly treated in the analysis (Katz 1982; Luker 2008).

If the index and analytic codes are applied reliably and analytic attribute-level categorization is consistent, it is possible to run text queries to document the robustness and the limitations of the findings (Maxwell 1992:48). On the frequentist end of the spectrum, which the software easily facilitates, the analyst may want to make statements such as "*N* respondents demonstrated this logic." As cautioned by scholars such as Small (2011), however, it's important to make sure that such statements are appropriate for the form of the data. For instance, if the interview protocol evolved over the course of the study, and the same questions were not asked of everyone, it may not be appropriate to report coding counts. It may also be the case that one wants to write about a topic that only applies to half of the interviewees. By querying codes, it is possible identify in how many transcripts the topic appeared, which might be considered a more accurate number of interviews to report in the Methods section of the paper than the full interview sample.

Conclusion, Strengths, and Limitations

In this article, we summarized the basic features of a grounded theory approach to qualitative interview analysis, assessed the current state of qualitative analysis of sociological interviews, and highlighted mismatches between grounded theory's prescriptions and current practice in the field. Based on our own experience working with large-scale interview data, we outlined a three-step process that flips traditional grounded theory on its head to take advantage of modern QDA technology. Rather than begin with small codes and aggregate up to a single set of concepts, we advocate for starting big with index coding and capitalizing on the flexibility of electronic retrieval for data reduction and conceptual refinement over time. We have seen many benefits to our approach in our own work and believe that flexible coding can help move the field of qualitative data analysis into the twenty-first century.

First, flexible coding begins with indexing hundreds of pages of data for easy retrieval, setting interview researchers up to take full advantage of the power of QDA—and of their large-scale data. The collection of in-depth interview data is a time- and resource-intensive process, and the ability to quickly enter and flexibly reanalyze data can help qualitative researchers to get as large a return as possible from their effort. Since it is not fine-grained,

index coding can be more easily dispersed among members of a research team than reliable analytic coding. The indexed data can then be distributed to members of the team so that researchers can apply their own thematic codes, a different model for qualitative teamwork than teamwork for the purpose of interrater reliability. Formatting data with an index and attributes prepares qualitative data for electronic archiving and makes data sharing more feasible, as recommended by the National Science Foundation Workshop on Interdisciplinary Standards for Systematic Qualitative Research (Lamont & White 2009). A flexible index also could reduce the burden of reanalyzing data in combination with data collected by other researchers or over time.

Second, the process of indexing allows one to get to know their data. While applying index codes, we read whole transcripts and begin writing person-level and thematic memos. At this stage, the analyst can begin playing with and refining concepts across interview cases. The initial thematic memos become the basis for analytic codes that are then applied across the full data set; it is not necessary to begin applying fine-grained coding to meaningfully begin (and begin documenting) analytic work.

Third, the process enables researchers to (more) reliably and efficiently apply analytic codes. After using memo writing for thematic development, the index allows researchers to reduce the amount of data under analysis. Compared to coding as suggested by grounded theory, our process can avoid hours of time muddying the story by overcoding. Applying thematic codes to reduced data during validation and refinement increases the likelihood that the coding is reliable and valid across hundreds or thousands of pages of data. In short, the process allows researchers to spend more time developing and elaborating concepts—and meaningfully linking them to data—than on cleaning up and combining line-by-line codes.

Fourth, by systematically attending to respondent attributes, researchers are positioned to take full advantage of QDA's data query capabilities. Examining the intersection of analytic codes at the text and attribute (typology) levels provides an opportunity to easily validate coding reliability and examine patterns in themes. Querying also identifies meaningful exceptions to themes. These negative cases are important for refining a data-based theory or limiting its scope.

Finally, a clear and systematic analytic process can increase transparency in qualitative research. To reduce the opacity of qualitative data analysis, methodology sections must be more specific than "I analyzed the data using qualitative software." Reporting additional information, such as the portion of a larger transcript that was relevant to the topic at hand, provides a clearer

idea of the breadth of information the author used to draw conclusions in a piece of research reporting. This may be particularly important for secondary analysis of existing data or qualitative work drawn from large, team-driven projects. Regardless of whether the data collection was conducted by a single researcher or across a research team, analytic transparency makes qualitative analysis more easily replicable or reinterpretable, which we believe is important for the rigor and credibility of qualitative research.

Limitations

While we use QDA software to flip the script on grounded theory, flexible coding may not be appropriate for every interview project. It might not be worth fully indexing transcripts for projects with a small number—fewer than 30—of interviews. If the research question is tightly circumscribed and the data are intended for a single article, it may not be important for the researcher (or others) to revisit data in the future. Finally, many of the published papers we examined included in-depth interviews as one of the multiple data sources. Some of these pieces were historical case studies, others were ethnographies, and some articles drew on a handful of interviews to add color to primarily quantitative analyses. In these circumstances, less intensive forms of interview data preparation and analysis may well be appropriate. And, of course, if the researcher truly performed a grounded theory study, with an unfolding data collection, where transcripts were analyzed as they were completed and the protocol modified toward a final emergent concept, then our method is not for them.

  Finally, we do not want to overemphasize the importance of easy quantification and tabulation of data, pressing too far beyond our primary concern about the internal validity of qualitative explanations. Our goal has been to suggest ways that qualitative researchers analyzing interview data can identify findings that are firmly grounded in the data they have collected, properly contextualize findings in the set of data as a whole, and easily identify negative cases for the refinement of theory. In the end, we believe that the job of generalizing theories generated by qualitative data falls to future research using more representative methodologies.

Conclusion

If the methodology sections of recent sociology journal articles are to be believed, qualitative data analysis appears stuck in the twentieth century. Grounded theory certainly deserves credit for the role it played in

systematizing analysis of in-depth interview data. But we suspect that—cursory citations to the contrary—it does not match the practice of many contemporary qualitative researchers. Today's in-depth interview studies are typically grounded in prior literature, comprised of large samples, matched with other data sources, collected or analyzed by teams of researchers, and drawn upon for multiple research products. We have argued that these changes in convention and the introduction of QDA technology demand renewed attention to the process of qualitative coding.

Our analysis of research articles published in ASA-sponsored journals demonstrates that the work of coding remains relatively opaque to readers of qualitative work. Our discussions with many other researchers who regularly use interview methodology, however, suggest they cite methodological classics in absence of better guidance, after reaching their own detailed process through a series of trials and errors. While tricks of the trade are likely shared informally, our goal here is to offer guidance for researchers facing hundreds of pages of text imported to QDA software. As we prepare to analyze the large volume of data resulting from today's disciplinary conventions, thoughtful attention to the structure and process of coding can produce an archive of information that may be revisited time and again, including by secondary analysts, improving the transparency and accountability of qualitative research.

Declaration of Conflicting Interests

Funding

ORCID iD

Nicole M. Deterding 🔴 https://orcid.org/0000-0001-5819-8935

Supplemental Material

Supplemental material for this article is available online.

References

Asad, Asad L. 2015. "Contexts of Reception, Post-disaster Migration, and Socioeconomic Mobility." *Population and Environment* 36(3):279-310.

Bail, Christopher A. 2016. *Terrified: How Anti-Muslim Fringe Organizations Became Mainstream*. Princeton, NJ: Princeton University Press.

Baker, Sarah Elsie and Rosalind Edwards. 2012. "How Many Qualitative Interviews Is Enough? Expert Voices and Early Career Reflections on Sampling and Cases in Qualitative Research." National Centre for Research Methods Review Paper, Economic and Social Research Council, Southampton, England. Retrieved September 13, 2018 (http://eprints.brighton.ac.uk/11632/1/how_many_interviews.pdf).

Bazeley, Patricia and Kristi Jackson. 2013. *Qualitative Analysis with NVivo*. London, England: Sage.

Blee, Kathleen. 2009. "Defining and Communicating Standards for Qualitative Research Rigor in Sociology." Pp. 148-52 in *Workshop on Interdisciplinary Standards for Systematic Qualitative Research*, edited by M. Lamont and P. White. Arlington, VA: National Science Foundation.

Bosick, Stacy. 2015. "Pushed Out on My Own: The Impact of Hurricane Katrina in the Lives of Emerging Adults." *Sociological Perspectives* 58(2):243-63.

Brown, Hana E. 2013. "Racialized Conflict and Policy Spillover Effects: The Role of Race in the Contemporary U.S. Welfare State". *American Journal of Sociology* 119(2):394-443.

Bryant, Antony. 2002. "Regrounding Grounded Theory." *Journal of Information Technology Theory and Application* 4(1):25-42.

Bryant, Antony and Kathy Charmaz. 2007. *The SAGE Handbook of Grounded Theory*. London, England: Sage.

Calarco, Jessica McCrory. 2011. "'I Need Help!' Social Class and Children's Help-seeking in Elementary School." *American Sociological Review* 76(6):862-82.

Calarco, Jessica McCrory. 2014a. "Coached for the Classroom: Parents' Cultural Transmission and Children's Reproduction of Educational Inequalities." *American Sociological Review* 79(5):1015-37.

Calarco, Jessica McCrory. 2014b. "The Inconsistent Curriculum: Cultural Tool-kits and Student Interpretations of Ambiguous Expectations." *Social Psychology Quarterly* 76(2):186-209.

Campbell, John L., Charles Quincy, Jordan Osserman, and Ove K. Pedersen. 2013. "Coding In-depth Semistructured Interviews: Problems of Unitization and Intercoder Reliability and Agreement." *Sociological Methods & Research* 42(3):294-320.

Chakrabarti, Parijat and Margaret Frye. 2017. "A Mixed-methods Framework for Analyzing Text Data: Integrating Computational Techniques with Qualitative Methods in Demography." *Demographic Research* 37:1351-82.

Charmaz, Kathy. 2000. "Grounded Theory: Objectivist and Constructivist Methods." Pp. 509-35 in *Handbook of Qualitative Research*, edited by N. K. Denzin and Y. S. Lincoln, 2nd ed. Thousand Oaks, CA: Sage.

Charmaz, Kathy. 2006. *Constructing Grounded Theory*. London, England: Sage.

Charmaz, Kathy. 2014. *Constructing Grounded Theory*. 2nd ed. London, England: Sage.

Collett, Jessica L., Kelcie Vercel, and Olevia Boykin. 2015. "Using Identity Processes to Understand Persistent Inequality in Parenting." *Social Psychology Quarterly* 78(4):345-364.

Deterding, Nicole M. 2015a. "Instrumental and Expressive Education: College Planning in the Face of Poverty." *Sociology of Education* 88(4):284-301.

Deterding, Nicole M. 2015b. "Start, Start Again: The College Pathways of Economically-vulnerable Mothers." Unpublished doctoral dissertation. https://dash.harvard.edu/handle/1/17463981. Accessed 20 September 2018.

Glaser, Barney G. 1992. *Emergence vs. Forcing: Basics of Grounded Theory Analysis*. Mill Valley, CA: Sociology Press.

Glaser, Barney G. 1998. *Doing Grounded Theory: Issues and Discussions*. Mill Valley, CA: Sociology Press.

Glaser, Barney G. 2005. *The Grounded Theory Perspective II: Description's Remodeling of Grounded Theory Methodology*. Mill Valley, CA: Sociology Press.

Glaser, Barney G. and Anselm L. Strauss. 1967. *The Discovery of Grounded Theory: Strategies for Qualitative Research*. Chicago, IL: Aldine.

Guest, Greg, Arwen Bunce, and Laura Johnson. 2006. "How Many Interviews Are Enough? An Experiment with Data Saturation and Variability." *Field Methods* 18(1):59-82.

Jerolmack, Colin and Shamus Khan. 2014. "Talk Is Cheap: Ethnography and the Attitudinal Fallacy." *Sociological Methods & Research* 43(2):178-209.

Kasinitz, Philip, John H. Mollenkopf, Jennifer Holdaway, and Mary C. Waters. 2008. *Inheriting the City: The Children of Immigrants Come of Age*. Cambridge, MA: Harvard University Press.

Katz, Jack. 1982. *Poor People's Lawyers in Transition*. New Brunswick, NJ: Rutgers University Press.

Lamont, Michele and Patricia White. 2009. *Workshop on Interdisciplinary Standards for Systematic Qualitative Research* (Final Report). Arlington, VA: National Science Foundation.

Lewins, Ann and Christina Silver. 2007. *Using Software in Qualitative Research: A Step-by-step Guide*. Los Angeles, CA: Sage.

Lowe, Sarah R., Kara Lustig, and Helen B. Marrow. 2011. "African American Women's Reports of Racism during Hurricane Katrina: Variation by Interviewer Race." *New School Psychology Bulletin* 8(2):46-57.

Lowe, Sarah R., Jean E. Rhodes, and Arielle A. J. Scoglio. 2012. "Changes in Marital and Partner Relationships in the Aftermath of Hurricane Katrina." *Psychology of Women Quarterly* 36(3):286-300.

Lowe, Sarah R., Jean E. Rhodes, and Mary C. Waters. 2015. "Understanding Resilience and Other Trajectories of Psychological Distress: A Mixed-methods Study of Low-income Mothers Who Survived Hurricane Katrina." *Current Psychology* 34(3):537-50.

Luker, Kristin. 2008. *Salsa Dancing into the Social Sciences: Research in an Age of Info-glut*. Cambridge, MA: Harvard University Press.

Maxwell, Joseph. 1992. "Understanding Validity in Qualitative Research." *Harvard Educational Review* 62(3):279-301.

Miles, Matthew B. and Michael Huberman. 1994. *Qualitative Data Analysis*. Thousand Oaks, CA: Sage Press.

Morris, Katherine Ann and Nicole M. Deterding. 2016. "The Emotional Cost of Distance: Geographic Social Network Dispersion and Post-traumatic Stress in Survivors of Hurricane Katrina." *Social Science and Medicine* 165(1):56-65.

Price, Heather and Christian Smith. 2017, August. "Process and Reliability for Cultural Model Analysis Using Semi-structured Interviews." Paper presented at the Annual Meeting of the American Sociological Association, Montreal, Québec, Canada.

Ragin, Charles, Joane Nagel, and Patricia White. 2004. "Workshop on Scientific Foundations of Qualitative Research." NSF Report 04-219, National Science Foundation, Arlington, VA.

Small, Mario L. 2011. "How to Conduct a Mixed-methods Study: Recent Trends in a Rapidly Growing Literature." *Annual Review of Sociology* 37(1):57-86.

Silbey, Susan. 2009. "In Search of Social Science." Pp. 76-82 in *Workshop on Interdisciplinary Standards for Systematic Qualitative Research*, edited by M. Lamont and P. White. Arlington, VA: National Science Foundation.

Strauss, Anselm L. 1987. *Qualitative Analysis for Social Scientists*. New York: Cambridge University Press.

Strauss, Anselm L. and Juliet M. Corbin. 1990. *Basics of Qualitative Research: Grounded Theory Procedures and Techniques*. London, England: Sage.

Timmermans, Stefan and Iddo Tavory. 2012. "Theory Construction in Qualitative Research: From Grounded Theory to Abductive Analysis." *Sociological Theory* 30(3):167-86.

Tollette, Jessica. 2013. "Nueva New Orleans: Race Relations and (Im)migration in the Post-Katrina South." Poster presented at the Annual Meeting of the Population Association of America, New Orleans, LA.

Wacquant, Loïc. 2002. "Scrutinizing the Street: Poverty, Morality, and the Pitfalls of Urban Ethnography." *American Journal of Sociology* 107(6):1468-532.

Waters, Mary C. 1990. *Ethnic Options: Choosing Identities in America*. Berkeley: University of California Press.

Waters, Mary C. 1999. *Black Identities: West Indian Immigrant Dreams and American Realities*. Cambridge, MA: Harvard University Press.

Waters, Mary C. 2016. "Life after Hurricane Katrina: The Resilience in Survivors of Katrina (RISK) Project." *Sociological Forum* 31:750-69.

Waters, Mary C., Patrick J. Carr, Maria J. Kefalas, and Jennifer Ann Holdaway. 2011. *Coming of Age in America: The Transition to Adulthood in the Twenty-first Century*. Berkeley: University of California Press.

Weiss, Robert S. 1994. *Learning from Strangers: The Art and Method of Qualitative Interview Studies*. New York: Free Press.

Weitzman, Eben A. and Matthew B. Miles. 1995. *Computer Programs for Qualitative Data Analysis: A Software Sourcebook*. Thousand Oaks, CA: Sage.

White, Michael J., Maya D. Judd, and Simone Poliandri. 2012. "Illumination with a Dim Bulb? What Do Social Scientists Learn by Employing Qualitative Data Analysis Software (QDAS) in the Service of Multi-method Designs?" *Sociological Methodology* 42(1):43-76.

Znaniecki, Florian. 1934. *The Method of Sociology*. New York: Farrar and Strauss.

Author Biographies

Nicole M. Deterding produced this work while a National Poverty Center Postdoctoral Fellow with the Institute for Research on Poverty, University of Wisconsin–Madison. Her research uses mixed methods to examine the role of postsecondary education and training in the lives of economically vulnerable adults. Empirical articles on which this article is based have recently appeared in *Sociology of Education* and *Social Science and Medicine*.

Mary C. Waters is the John L. Loeb Professor of Sociology at Harvard University. Her large-scale interview studies have examined the integration of immigrants and their children; the transition to adulthood; the measurement and meaning of racial and ethnic identity; and the social, demographic, and psychological impact of natural disasters. She is the coauthor, most recently, of *The Art and Science of Social Research* (2017, W. W. Norton).