



CENTERING ANALYSIS STRATEGIES AND OPEN TOOLS FOR QUALITATIVE DATA ANALYSIS

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INTRODUCTION

In recent years, academic libraries have devoted a greater share of their resources to building an infrastructure for work with data. Data services help researchers locate and use existing data sets as well as collect, securely store, and analyze new data. Researchers may be able to access data analysis software through the library, consult with staff who have expertise in data use, or receive instruction in data-related techniques or software.¹ For qualitative researchers, this support infrastructure may include access to qualitative data analysis (QDA) software or instruction in the use of these tools, such as the NVivo-focused workshops described by Swygart-Hobaugh and Røddesnes, Faber, and Jensen.² Recent research suggests, however, that services and infrastructure in support of methods using qualitative data may be less robust than the support for work using quantitative data.³ Information about services for qualitative work is often hard to find on library websites,⁴ and qualitative research support is less likely to be explicitly mentioned in ads for data-related work in libraries indicating that it is less of a focus for libraries hiring data librarians.⁵

In this paper, I argue that academic library infrastructure in support of research using qualitative data can be strengthened by centering instruction on the use of QDA software around the strategies used by researchers to classify, transform, and view their data as they answer their research questions. Given the access limits of proprietary QDA software, we can also take the opportunity to show how open source or free-to-use tools can be used to enact these strategies. By moving our focus to strategies, libraries can support a wider range of patrons who seek to conduct creative, transparent, and rigorous qualitative research, regardless of their access to proprietary software tools.

This proposed method of supporting QDA software use draws on my experiences redesigning the workshops in my library's research workshop series and consulting with individual researchers on using software in qualitative work. I also draw on my recent experience co-teaching a doctoral level course on the use of QDA software in social sciences and educational research, a course which was centered on analysis strategies that could be deployed across software programs.

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QUALITATIVE DATA, ANALYSIS STRATEGIES, AND THE ROLE OF QUALITATIVE DATA ANALYSIS SOFTWARE

I use qualitative research here to refer to any systematic investigation that uses qualitative data, regardless of the research design. While analysis of qualitative data is often associated with interpretive and critical methods, qualitative data can be used in a diverse array of research designs, including designs intended to develop testable and generalizable claims about a concept under study.⁶ Qualitative data is often in text formats, such as transcriptions of interviews or open-ended questions from a survey, but can include other types of data, such as images, audio or video files, social media content, and GIS data. Researchers may conduct interviews or focus groups to collect data for analysis, but they may also re-use data from previous studies or identify existing data that can be analyzed to address their research questions.

Regardless of their research design, researchers use analytic strategies when they interpret qualitative data. Analytic strategies are the actual moves that researchers make with qualitative data as they develop an understanding of what is happening in the data and what that means for the questions at hand.⁷ Coding data and then looking at the data through the codes is one example of a strategy, and one that often takes up significant time in the early stages of a research project.⁸

Examples of additional analysis strategies include:

- Transcription of media data into a text format for further analysis.
- Integrating qualitative data with numeric or categorical data so that the researcher can compare data across relevant variables (e.g., participant demographics).
- Using keyword search and automatic coding tools to identify locations of relevant terms in a text in order to identify patterns of language use.
- Queries that display coded data at the intersection of particular codes to understand relationships of codes – and ultimately concepts – to one another.
- Determining the frequency of words or phrases used in a text data set to assess the language use and how it is distributed across the data set.

Decisions about how to qualitative data are shaped by the research design, including the methodology, epistemological assumptions and even the researcher's conception of how research can (or cannot) access reality.⁹ Researchers should also be cognizant of how their decisions around data analysis are shaped by their research context, such as relationships to project participants, disciplinary norms, expected ways of sharing or publishing the research, and the researcher's social and cultural identities.

Researchers using qualitative data make use of different tools for analysis, including printed data and highlighters for marking up relevant aspects of the data. Since their advent in the 1980s, software for data analysis has grown in importance for researchers who use qualitative data.¹⁰ Today, software for QDA is a diverse field, with tools available for Mac and Windows devices, as well as cloud-based applications that can be accessed through a web browser. Cloud based programs mean that research teams can work on the same project file simultaneously, while desktop-only programs require that researchers merge separate copies of the file together after each researcher has worked on the file. There are several popular programs, but no market-leader, and new programs continue to appear.¹¹ The cost of licenses for these software programs can range into the hundreds of dollars, though most offer student licenses at a significantly reduced price. Some campuses may centrally purchase licenses, facilitating access to at least one QDA software program.

In addition to the proprietary programs, there are several open source and free-to-use tools, such as Taguette, but open-source tools may require more technological and methodological savvy on the part of the user with fewer resources available for learners to develop their skills compared to proprietary programs. In addition to dedicated QDA software, researchers may also make use of word processing or spreadsheet software, repurposing the tool to fit their needs.

QDA software use has been subject to critique, including persistent fears that using these tools distances from the data and that the software will become the driving force of the analysis, rather than the intended research design and knowledge of the researcher.¹² In contrast to those fears, proponents of software use recognize the potential for software to facilitate the analysis of larger data sets and non-text data, and to encourage creative

approaches to analysis that are not feasible using manual tools. Proponents of software use also argue that using such tools can contribute to the rigor of qualitative analysis by ensuring that researchers are able to more comprehensively look at the data and better document and transparently describe the process of analyzing and interpreting their data.

Transparency has become an important criterion for evaluating the rigor of qualitative research.¹³ Without openness about the analysis process, the act of establishing a proposed meaning of the data can be seen as a private process particular to the thoughts of the researcher which can lead to concerns about the validity of the work.¹⁴ Kristi Jackson's concept of "transparency in motion" offers useful guidance on how we can practice and communicate openly about the process of analysis, rather than thinking of transparency as an idealized practice that either exists or does not. Under Jackson's model of transparency in motion, researchers engage in three main practices that contribute to the transparency of the research project, including (1) triaging, or the selecting of data on which to focus during analysis or identifying data that is missing from the data set; (2) showing, in which researchers work to make clear the analytic tasks that they have conducted and how those tasks lead to their analysis; and, (3) reflecting on the process of analysis and how the researcher's social positioning and expectations of intended readers shape the process of analysis.¹⁵

These practices require that researchers must be able to effectively describe the choices they've made throughout the research process, including how they have used QDA software. QDA software use is often poorly described in published literature. Writers may only mention the use of a software in passing, and or claim that software use enhances the rigor and validity of their work without offering details on how this the tool was used to develop their interpretation.¹⁶ Often, this way of writing positions interpretations of the data as waiting for discovery by the researcher, as in the cases where themes are described as emerging from the data. This framing removes the researcher and their decision-making from accounts of the research process and runs counter to the need to transparently describe the analysis process. Instruction around the use of QDA software can support the use of transparent practices by making clear how decisions made by the researcher drive the process, rather than by treating analysis as output of the software tool.

Learning to use QDA software is often a difficult undertaking. Effective use requires that the researcher be well-versed in qualitative methodologies and adept at implementing a chosen methodology in the context of their own work. In addition to this methodological knowledge, research using QDA software draws on the researcher's general technological capabilities and ability to operate the specific software tool.¹⁷ Some researchers encounter limited or uneven local infrastructure to guide decisions about what software to use and how to make the most of the software capabilities. Christian Schmieder has argued that students learning qualitative methods should have access to an "ecology" of methods education, in which they can learn about methods, analysis strategies, and have the opportunity to practice using QDA software. Rather than existing in a single course, this type of instruction would be embedded across a curriculum and infrastructure that exists beyond the department, such as instruction offered in the library.¹⁸

QDA SOFTWARE INSTRUCTION IN ACADEMIC LIBRARIES

Instruction around the use of QDA software in academic libraries has received relatively scant attention in the LIS literature about data services, as noted by Mandy Swygart-Hobaugh in her 2016 contribution to a book on *Databrarianship*.¹⁹ Karen Downing and colleagues draw on this observation in their research to better understand the "unmet needs" of researchers using qualitative data throughout the research lifecycle. Their participants noted repeated frustrations in accessing and using QDA software, with one noting that they had abandoned dedicated QDA software in favor of Word and Excel documents after their attempted use turned into a "nightmare". Participants in the study were mixed in their reception of workshops as potential ways to learn about effective use of QDA software, but the paper does not provide details on the nature of the workshops that may be offered.²⁰ Jonathan Cain, Liz Cooper, Sarah DeMott, and Alesia Montgomery explored the information about QDA support on academic library websites and found that information on workshops and other means of support were difficult to find, and often relied on patrons to know the names of proprietary programs in order to locate relevant information.

In a few cases, we can find details of how libraries have implemented support specifically for QDA software programs. Sara Rødnes, Hege Charlotte Faber, Magnus Rom Jensen described the implementation of NVivo workshops at the Norwegian University of Science and Technology Library. They offer an extensive, two-day workshops intended for novice users of NVivo that moves from beginning a project file to presenting analyses and interpretations. This workshop, they note, meets a previously unfulfilled need on their campus.²¹ Swygart-Hobaugh has also provided details of an NVivo workshop taught collaboratively with a Sociology faculty member, Ralph LaRossa. LaRossa has devised a framework for analyzing qualitative data that moves the researcher from a description their own data to the development of theoretical explanation. In their joint workshop, LaRossa describes the analysis approach with Swygart-Hobaugh demonstrating how to put the strategies in action using the features of NVivo.²² Swygart-Hobaugh's example demonstrates how instruction around the use of QDA software can be inclusive of analysis strategies.

QDA SOFTWARE INSTRUCTION CENTERING ANALYSIS STRATEGIES

Developing instructional programs around the use of QDA software that centers analysis strategies can strengthen academic libraries' existing infrastructure in support of work with qualitative data as well as inviting participation from a broader range of campus community members. In this section, I describe how I've redesigned my library's workshop offerings and online materials to focus on the ways that researchers may work with their data, regardless of the software they have available. Access to QDA software is a significant barrier, and researchers may have variable access over the course of their careers. Understanding the types of analytic tasks that can be implemented through software means that researchers are better prepared to deal with a scenario in which they move institutions and now have a different tool available, when they are engaged in collaborative research where others have access to different tools, or when they work with students or other researchers who do not have access to *any* dedicated software.

Centering analysis strategies will likely require re-design of workshops on the use of QDA software. At my library, this has meant adding a new workshop to our lineup on preparing for analysis of qualitative data and choosing a software tool, changing the focus of our workshops on NVivo and Atlas.ti, and developing a workshop on the open-source software Taguette.²³

Updating Workshops for Existing Proprietary QDA Software

Our workshop lineup still includes sessions on specific QDA software, but with a change in their overall framework in order to focus on strategies. NVivo and Atlas.ti are offered in the library's in-person and virtual computer lab machines and have historically been the focus of QDA software workshops in our series. Teaching earlier versions of these workshop felt like running through a list of technical features of the software and showing where to click to get access to each feature, similar to showcasing the features of database. This point-and-click style instruction was made more challenging by the variation in interfaces between Mac and Windows versions of the software and different editions, particularly for NVivo. Knowing where the presenter clicked to access a type of query, for example, would not necessarily translate to knowledge of how to do so on the researcher's own version of the software.

In the most recent iteration of the Atlas.ti and NVivo workshops, I point to specific features but, similarly to Swygart-Hobaugh, describe how those can be used for QDA strategies. In Atlas.ti, for example, researchers can use coding tools to mark quotations within the data that are relevant to their research questions. I present these coding features as a way of adding structure to the qualitative data to help us answer questions. We can compare see how all participants have responded to an interview question, for example, by coding answers to that question with the same code and then retrieving all of the answers to that question across participants. If we also use Atlas.ti's document group features, we can look at groups participants (such as demographic categories) and compare answers for those with different backgrounds.

Described this way, coding becomes more than just the next step that a researcher does after collecting qualitative data and is positioned as a way of structuring the data so that we can make an interpretation. This

approach also means we can point explicitly to the decision-making process of the researcher in deciding *how* to code. In our hypothetical example, if we had first coded the data in some other way – using a coding scheme we derived from previous research on the subject area, for example – we may come to different interpretations of the data. In fact, a benefit of using QDA software is that we can decide to code in multiple ways, thereby extending our interpretive capabilities beyond the limits of what is practical using manual methods of analysis.²⁴

New Workshops: Planning Qualitative Data Analysis

In addition to revamping the existing workshops, I have developed two new workshops. One offered early in the semester is intended to help researchers plan a qualitative research project and choose which software tools they need (if any). In this workshop, I describe factors that shape how attendees will analyze their data, from the specifics of their research question to the disciplinary and social factors that will influence how they conduct and share their research. Figure 1 shows a slide illustrating the project-specific and research context factors to be considered in designing an analysis plan.

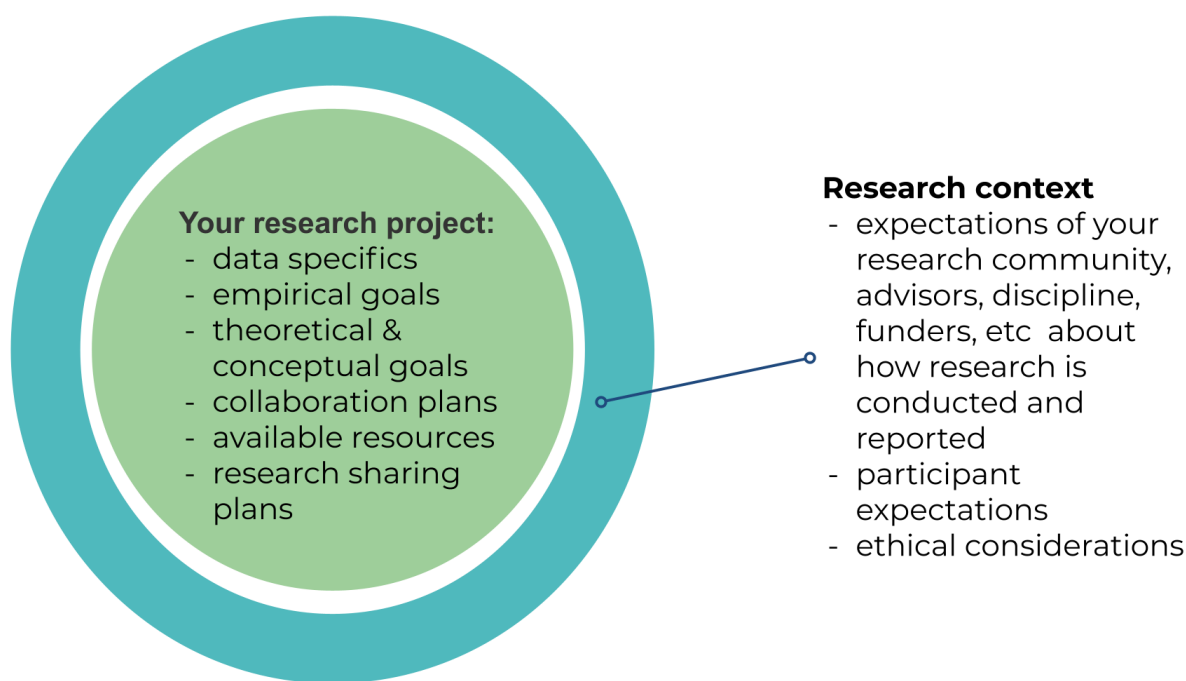


Figure 1. A slide used in a workshop on planning qualitative data analysis that illustrates the factors researchers may consider as they plan their research design

The workshop continues with more information on these factors and asks participants to consider, for example, their plans for collaboration or how they will share the results of their analysis. Whether they are writing a class paper, dissertation, or article for publication, researchers should consider the expectations of their audience when planning their research design and choosing which tools they will use. Each department, discipline, and publication will have expectations about the types of methodologies that are acceptable for creating new research, as well as standards for how qualitative analysis will be described. Some methodologies will call for consistent coding across members of a team and for the report to include measures of inter-rater reliability, for example. By considering these factors in advance of the analysis process, researchers can conduct and document their research in a way that better positions them to share the work in the way they intend.

In addition to asking attendees to consider the factors that will shape their analysis plan, the workshop offers an overview of analysis strategies that they may use, regardless of the tools at hand. Figure 2 shows a slide from a version of this workshop requested by the library's Doctoral Research Support Program which illustrates matrix

queries. Using matrix queries, researchers can view their qualitative data at the intersection of multiple codes or even codes and categorical variables (as with the Atlas.ti example described above). Queries are powerful tools for comparing data and developing new interpretations. Each QDA software program that offers a matrix query will describe the feature in different terms. A researcher who knows of this strategy and how it can enhance their analysis, however, can ensure that they choose a tool that includes this feature.

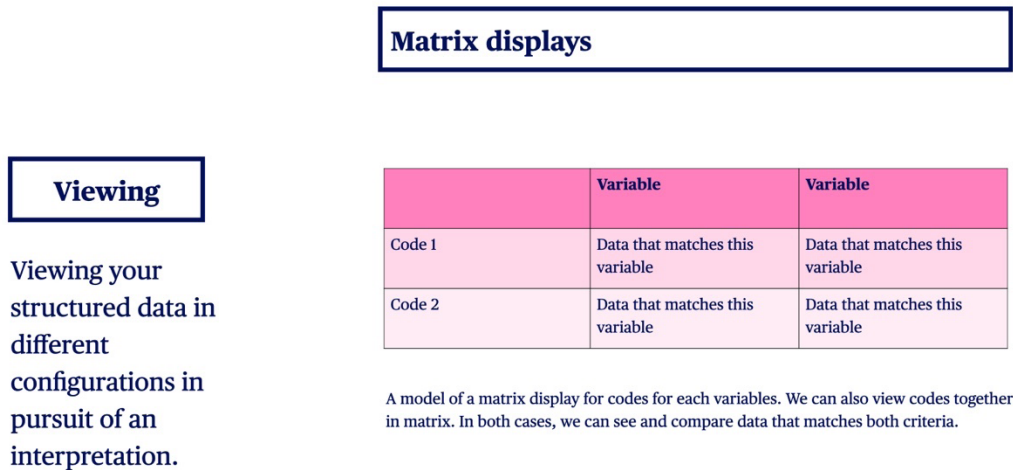


Figure 2. A slide used in a workshop on planning qualitative data analysis that demonstrates the purpose of a matrix query.

New Workshops: Taguette

A second new workshop we now offer in our workshop series is one that describes the use of the open-source tool Taguette. Taguette was developed by Rémi Rampin, in collaboration with Vicky Rampin and Sarah DeMott. The program can be installed on the researcher’s own device or server, or researchers can use the Taguette-provided server. Projects stored on shared servers allow multiple researchers to collaboratively and simultaneously work with their data.²⁵



Figure 3. A slide from a workshop on Taguette describing how data coded in Taguette can be exported to a spreadsheet and combined with participant data.

Similar to workshops on NVivo and Atlas.ti, attendees at this workshop learn how the features of the tool can be used to practice QDA strategies. In this workshop, we also explicitly discuss how researchers may make use of non-QDA software to in their analysis. Taguette does not have integrated features like the matrix query described above or the ability to link variables to the text data. Coded data can be exported to an Excel file, however, which means that the exported and coded segments of the data can be combined with additional data and analyzed using spreadsheet features. In the workshop, we look at how participant data for interviews can be included as new columns in the spreadsheet. With this data added, researchers can compare coded data across categories using the filtering function in their spreadsheet software, similarly to how they would do so using query features in proprietary software.

An added benefit of offering instruction on the use of Taguette is that a graduate assistant without ready access to proprietary software was able to learn to use the tool in order to teach an iteration of the workshop and create tutorials.²⁶ For libraries without access to or campus interest in proprietary software, there is an opportunity to share open or free-to-use tools that may not be widely known among members of the community.

CONCLUSION

Research using qualitative data can offer us powerful insight into the social world. But the diversity of approaches and tools used, combined with limited campus infrastructure for qualitative work can hinder those who use qualitative data. The series of workshops described here are part of an effort to strengthen infrastructure in support of qualitative research across campus. These workshops are attended by graduate students, faculty, and staff from a wide range of departments, indicating the diversity of disciplines in which qualitative data is used. While qualitative work can be conducted using many different methodological approaches, researchers share the need to develop and transparently explain the strategies that they use to structure and view their data from a variety of vantage points and develop answers to their research question. There are many tools that can facilitate analysis, but their availability is restricted by cost in terms of both licensing fees and the time it takes to learn how to effectively use the software. Academic libraries can enhance existing research data services by adapting instruction on the use of QDA software to include an intentional focus on the analysis strategies and making clear that there are tools available beyond the proprietary software, including open access and free-to-use tools that can fill some of the gaps left by proprietary software access limits. This approach recognizes the value of qualitative research to disciplines across campus and better positions the academic library to offer data-related services to a wider range of its constituents.

NOTES

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