

# Qualitative Research: The “Ethnography of Annotation” Model

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## Qualitative Research

When embarking on a research project, the methodology one chooses to work with is fundamentally important in determining both the form that the research will take as well as the success of the final product. In order to determine the most effective methodology to use, there are two variables to consider (Patton, 2002). The first is the current state of research in the proposed area of study. For example, in an established field, where widely accepted theories already exist, experimental or other quantitative methods might augment or enhance those existing theories. However, in a research area lacking widely accepted theory, experimental methods are less appropriate, because if there's no prior research upon which to build, there is no reason to assume that the collected data will be relevant, that measurement methods will be appropriate, or that any discovered relationships will make sense (Glaser & Strauss, 1967). The second issue to take into account when deciding upon a research methodology is the proposed research goals. If a researcher wishes to test different information retrieval algorithms, for example, he or she will choose different methods than the researcher who wishes to explore the concepts and processes of performance, interaction and interpretation of variable objects.

To say one is doing "qualitative research" infers an assortment of philosophical positions, methodological tactics, and analytical procedures. Morse (Morse, 1994) summarizes the cognitive processes involved in qualitative research; he believes that, regardless of the specific approach, qualitative research involves:

- *Comprehending* the phenomenon under study;
- *Synthesizing* a representation of the phenomenon, which accounts for linkages and relationships within its pieces
- *Theorizing* the how and why these relationships appear the way they do; and
- *Recontextualizing* the new knowledge.

The term *qualitative* implies an emphasis on examination of the processes and meanings, but not measured in terms of quantity, amount, or frequency (Labuschagne, 2003). Typically, qualitative methods produce a lot of detailed data about a small number of cases, and provide a depth of detail through direct quotation, precise description of situations and close observation. The great strength of qualitative research is that it attempts to depict the fullness of experience in a meaningful and comprehensive way.

Qualitative research then, is most appropriate for those projects where phenomena remain unexplained, where the nature of the research is uncommon or broad, where previous theories do not exist or are incomplete (Patton, 2002); and where the goal is deep narrative understanding or theory development (Hammersley & Atkinson, 1983). Qualitative methods for data collection typically include participant observation, open-ended or semi-structured interviews, and qualitative content analysis of documents.

## **Ethnography of Communication / Annotation**

One of the most common flavors of qualitative research is *ethnography*, which seeks to understand human behavior within its own social setting. Closely related, the ethnography of communication model uses anthropological methods to study verbal interactions in its own social setting (Hymes, 1964), and tries to understand, as completely as possible, from as many different viewpoints as possible, the ways people interact with each other, their environment, and their technologies. The basic unit of analysis in the ethnography of communication model is called the “communicative event,” and meanings are conveyed through “speech acts” (Searle, 1969), which can either be defined as a command, a request, or a recommendation among many other options. Ethnographers of communication use traditional qualitative methods of participant observation, interviews, and document analysis as their research tools (Saville-Troike, 2003), only differing in

the level of immersion the researcher attempts, and the depth of information the researcher tries to contemplate. Implementation of this approach need not be exact; the model provides valid data whether the researcher is trying to understand the customs and behaviors of residents of Papua New Guinea (Hymes, 1985), or the context of children's information seeking behaviors (Solomon, 1991).

### ***Observation***

Observation is an essential component of the ethnography of communication model. Observations are useful for a number of reasons. They can provide the basis for starting the research, they help familiarize the researcher with participants and the existing methods and procedures of communication; they help formulate introductory descriptions and explanations; they provide focus and structure for subsequent interviews; and observations ultimately provide an opportunity to build strong and robust foundations for thinking about and describing the research topic.

One criticism of the ethnographic method is that it is not objective – the researcher's beliefs eventually become intertwined with his or her theories thereby making the data and findings unreliable. This is a complicated problem. In any research setting, observation is a means to comprehension of a particular question. However, ethnographic methods have a much more comprehensive goal of gaining an almost complete understanding of a situation or event. In order to achieve this level of understanding, the researcher must become involved in the situation under scrutiny. Many believe that there has to be an interrelationship between researcher and subject, not only because it's impossible to have an "objective" distance, but also because striving for objectivity is not a realistic goal and perhaps in this case is even counterproductive. Interactivity between researcher and subject is what allows the ethnographic investigator to

discover “the truth.” For this reason, the ethnographic researcher embraces interactivity in observational settings, and indeed takes advantage of it in order to come to the greatest understanding of the problem at the deepest level. So instead of being a flaw, researcher involvement becomes an asset in its focus on deep understanding.

### ***Interviews***

There are different types of interviews in qualitative research: structured, generally recognized as questionnaires; semi-structured, in which the interviewer has a list of questions he or she wants to cover but which also allow for a certain amount of divergence from the script; and open-ended, in which there might be one or two themes that the interviewer wants to talk about, but generally follows the lead of the interviewee (Weiss, 1994).

Hitchcock and Hughes (Hitchcock & Hughes, 1989) prefer the semi-structured interview format because it allows the interviewer to further develop and expand upon particularly interesting responses, and in the best-case scenario, develop a kind of relationship with the participant; where negotiation, discussion and expansion of responses can occur. Semi-structured interviews should to be organized so that the participants, while answering specific questions, feel free to augment the conversation with what they consider valid, if uncovered information. Additionally, while the “semi-“ ness of semi-structured interviews allow a level of freedom in questions and responses, the “structured” part provides a means to ensure consistency across interviews.

### ***Annotations***

Studying user annotations is a new field of study in information science, and as such, the research methods and goals have not yet been fully described. It might be useful to think of these

annotation studies (detailed below) as an extension of ethnographic research, essentially seeing them as a form of the ethnography of communication model. It's important to stress that most annotative studies must, of necessity be ethnographic to a degree, because only the most formal annotations are explicit enough to not need user clarification. The researcher needs to interact with users in their setting to come to a fuller understanding of the purposes and uses of annotations.

The Oxford English Dictionary defines the term “annotation” as “a note added to anything written, by way of explanation or comment,” which corresponds to typical usage. Common applications of the word “annotation” are in the fields of literary, historical or religious scholarship, where annotations, typically called “marginalia,” provide researchers with valuable contextual information about primary sources. Another common example is an “annotated bibliography,” which is a list of citations with contextual or thematic notes attached.

The term ‘annotation’ is not limited to general use, however. Within specialized fields, the meaning can vary significantly. In legal and governmental domains, annotations specifically refer to notes providing information about interrelated decisions and legal statutes. These “annotations” can be very long, and are updated frequently (e.g., (White, 1970)). In the medical field, an annotation is an essay-length review article on a particular disease or treatment (e.g., (Viding, 2004)). In molecular biology and genomics, annotations are similar to metadata – terms and phrases that describe the structure, functions, locations and provenance of underlying resources like raw biological sequence data (e.g., (Stein, 2001)). [Overview provided in (MacMullen, 2005)].

### **Annotations in Information Science**

In the field of information and library science (ILS), annotations are becoming widely recognized as valuable indicators of user interaction with a primary object or text. Most

annotation studies are focused on developing new systems for reading, writing, or interacting with digital data. Many studies focus on readers: Shipman (Shipman, Price, Mashall, & Golovchinsky, 2003) analyzed law-students' annotations to determine important parts of a text; Marshall, conducted studies on the annotation behaviors of college students (Marshall, 1997), finding that annotations serve a number of purposes: First, they're *procedural signals*, telling the student where an assignment starts and ends, what part of the reading is important (or unimportant), and which sections deserve or require successive readings. Second, annotations are *placemarks*: they reserve quotes or ideas that the student will need to re-use in later in the term. Third, the margins of books are "an in situ way of working problems" (Marshall, 1997; p. 5). Fourth, annotations record *interpretative activity* either getting the interpretation externally – from the lecture – or by careful reading. Fifth, annotations "act as a visible trace of a reader's attention." And finally, some annotations are merely incidental marks that are the *material circumstances of reading*. Marshall, in addition to writing numerous annotation position papers (Marshall, 1998b); (Marshall, 1998a), has also explored the relationship between personal and shared annotations (Marshall & Brush, 2004) conducting a study that compared students' personal annotations with related comments they shared with each other using an online system. This study implies that the usefulness of annotations might be less than expected, finding: 1) most annotations made while reading were not directly related to discussion comments; 2) some types of annotations, like anchors in text with margin notes, were more likely to become the basis for public discussion; and 3) personal annotations underwent dramatic changes when they were shared with others. On the other hand, Wolfe's study (Wolfe, 2000) on the effects of annotations on student readers and writers found that while annotations perhaps did not have a direct effect on output (they didn't directly quote their annotations), the process of annotation did

seem to have an indirect effect of making the students' papers more cohesive, better written, and better argued.

### Annotations' Dimensions of Use

Marshall's annotation framework (Marshall, 1998b) provides a powerful construct for thinking about and studying these artifacts of interaction (figure 2). She identifies annotations as "reflections of a reader's engagement with a text," which may or may not prove valuable after the reader has finished his or her commitment to the text.

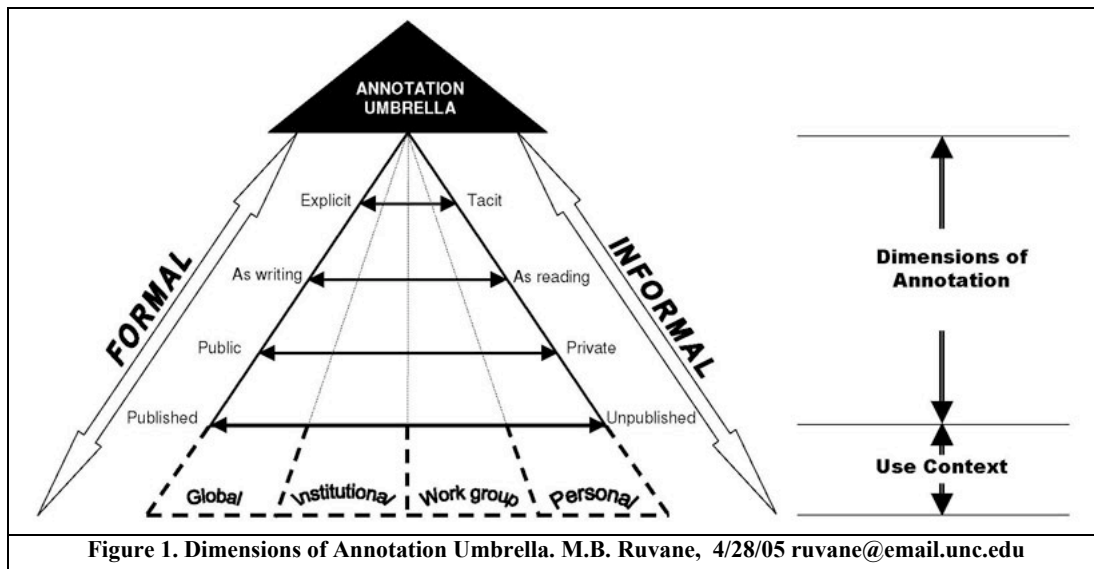


Figure 1. Dimensions of Annotation Umbrella. M.B. Ruvane, 4/28/05 [ruvane@email.unc.edu](mailto:ruvane@email.unc.edu)

There are two primary dimensions in Marshall's framework: Formal and informal. *Formal annotations* are often metadata-like, explicitly defined and meant for public discussion. They have long-term, permanent value, and are not tied to a specific reading or context. They're formally written and often can be regarded as a form of public authorship. *Informal annotations* are tacit, meaning they're personal; their meaning is ambiguous to someone other than the annotator. They're primarily a reading by-product, and are meant to be private. They often have transient value, meaning they're only useful while the reader is actively engaging with the text.

The context of annotation production and use ranges from *global* to *institutional* to *work*

*group*, to *personal*. Generally, the more formal the annotation is, the broader its context of use. For example, a Variorum Shakespeare edition would be considered a highly formal annotation of a published work, with a global context of use. Handwritten notes on a college textbook would generally be considered informal annotations with a personal context of use. It is conceivable, however, that an annotation could be informal but with a broad context of use or highly formal with a personal context of use.

### **Annotation Typologies**

In addition to Marshall's "dimensions of annotation," MacMullen (2005) has developed a general typology for annotation research, based on Buckland's typology for information (Buckland, 1991), which I intend to follow. He sets out three categories: annotation-as-process, annotation-as-thing, and annotation-as-knowledge.

*Annotation-as-process (AP)*. By studying the processes by which annotations are created, sustained, and utilized by both human and non-human entities, we can come to a greater understanding of their value. These processes range from informal personal annotation behaviors to automatic annotation techniques to organizational workflows, which influence annotation behavior.

*Annotation-as-thing (AT)*. This is the study of the different physical realizations of annotations, their properties and attributes, both alone and in relation to the information objects to which they are linked. The study of *AT* also analyzes an annotation's ability to function as another type of information object in another use context, and with interoperability across contexts. For example, something that might be an annotation in one context might be operationalized as a piece of metadata or index term in another.

*Annotation-as-knowledge (AK)*. This refers to the intellectual component of annotation, distinct from its physicality. Annotations convey knowledge and meaning, and the study of *AK* focuses on uncovering those meanings.

### ***Document Analysis***

Typically, the documents analyzed in qualitative research include all documents related to the research, like: transcripts of interviews, written open-ended items on questionnaires, personal diaries, observation video tapes, and various forms of documentation. In annotative studies, there's usually an additional type of document under scrutiny: the document that has been annotated. Consequently, in addition to doing document analysis on the output of the research, annotative studies analyze primary documents that have been marked up by research participants. All of the standard document analysis techniques apply to these annotated primary documents as well.

The purpose of content analysis is to develop a valid framework in which it's possible to make reproducible inferences from the text. Becker & Lissmann (1973, quoted in (Mayring, 2000a), have identified two levels of content appropriate for analysis: primary and latent. Primary content includes the themes and main ideas of the text, and latent content includes any contextual information within the text.

Qualitative content analysis focuses on the empirical and methodological analysis of texts within their context of communication. These methodological and empirical rules recall the advantages of quantitative content analysis, and there are a number of specific procedures involved in robust method:

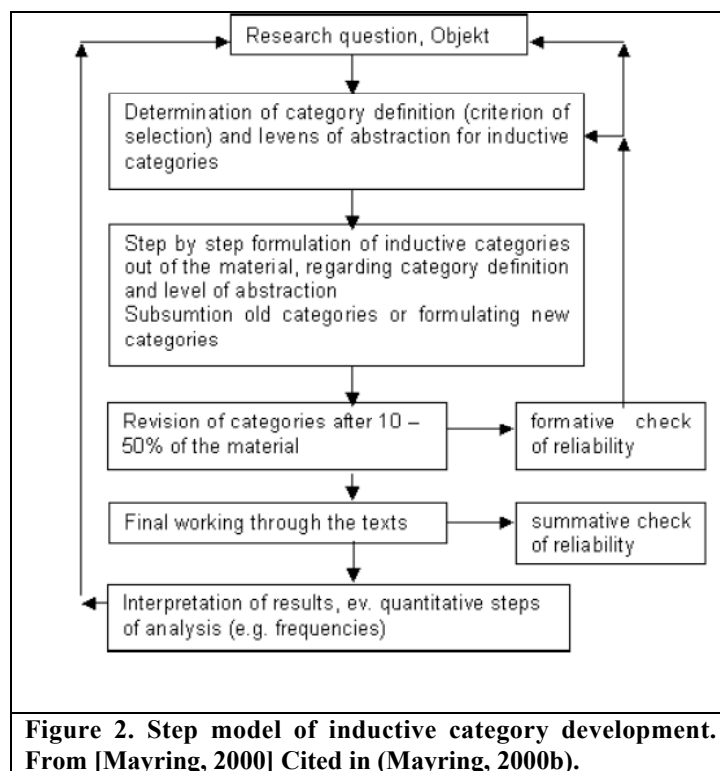
- *Model of communication*: before beginning analysis, the researcher should decide which part of the communication are under analysis; how the interviewer's preconceptions and

biases might influence data collection and the interaction between researcher and research participant; and the context of text production and reception.

- *Category Development*: The documentary material must be analyzed in a consistent manner, following procedural rules.
- *Category Application*: The categories of analysis should be based on the research questions, and refined by the process of analysis.
- *Reliability and validity*: The content analysis procedure seeks to be valid across different researchers. There are various methods to ensure this.

### Qualitative Content Analysis Procedures: Inductive Category Development

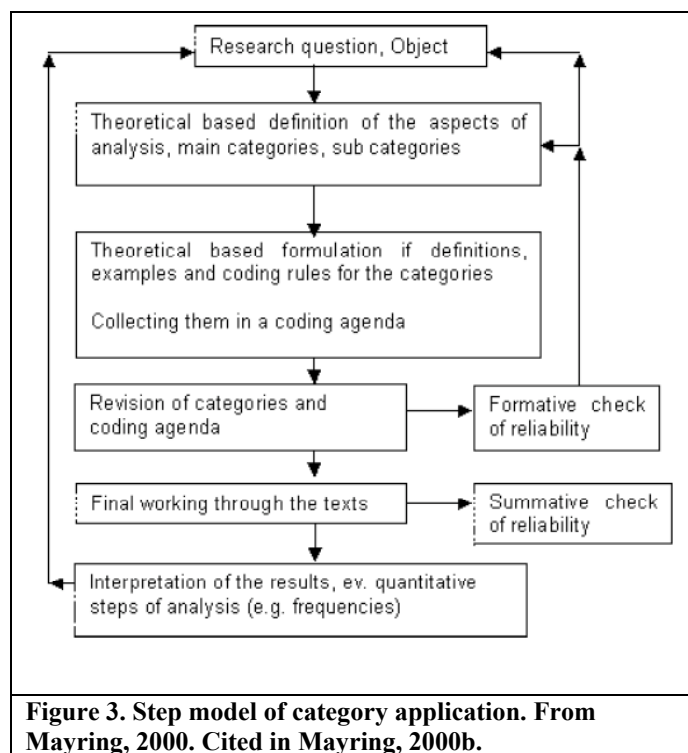
Development of categorical analysis units is an enigmatic process. “How categories are defined...is an art. Little is written about it” (Krippendorff, 1980). Mysterious though it might be, categories should be closely related to, and developed in terms of, the text. Figure 2 illustrates the steps for categorical development.



Essentially, the purpose on this procedure is to develop criteria for analysis, derived from: theoretical knowledge of the issues at stake, the research questions, and the text itself. Based on these criteria, the researcher works through the text and develops categories. The categories are revised and reduced within a feedback loop, and checked for reliability.

### Qualitative Content Analysis Procedures: Deductive Category Application

Assignment of the categories to specific passages in the text involves the development of explicit definitions, coding rules for each category, and determination of the circumstances under which a text passage can be coded with a specific category. Figure 3 illustrates this step-by-step process.



The form that each of these steps take varies dependent on such factors as the research question, the researcher's orientation to the question, and the setting and context of the study. [Thorne

(Thorne, 2000), 2000].

### **Computer Programs Supporting Qualitative Content Analysis**

Qualitative data analysis is a complex and multifaceted process. In the last few years, there's been a proliferation of Computer Assisted Qualitative Data Analysis Systems (CAQDAS), which has resulted, some researchers say (Coffey, Holbrook, & Atkinson, 1996), in many qualitative research projects looking very much alike, generally resembling the constant comparative method, refined by Glaser and Strauss in their 1967 study of death and dying. This method essentially entails taking one piece of data, whether it's an interview, a statement, a theme, or a note and comparing it to any and all other pieces of data to assess similarity or differences. Many qualitative studies, including this one, seek to generate knowledge about common patterns and themes within human experience. In developing the theory of possible relationships between various pieces of information, this constant comparison of information is repeated ad infinitum, until a new theory is developed.

This project will have textual, as well as audio and image-based data. One computer program has the capabilities to deal with multiple media: ATLAS.ti. This program is a powerful tool for the qualitative analysis of large bodies of textual, graphical, audio, and video data. It offers a variety of tools for accomplishing the tasks associated with any systematic approach to data that's difficult to analyze using formal statistical approaches. ATLAS.ti assists in exploration of complex phenomena "hidden" in multimedia data by providing tools to manage, extract, explore, and recontextualize meaningful pieces of data in flexible, creative and systematic ways (Muhr, 2004).

### **Research Reliability & Validity**

The validity and reliability of qualitative research depends on the researcher's skill, sensitivity and training in the field. There are additional specific methods a researcher can

perform to ensure data validity and reliability. *Triangulation* compares the results from two or more different methods (i.e., data from interviews and observation), or two or more data sources (interviews with members of different groups) to check for consistency in answers and attitudes. Instead of using triangulation as a stringent test of validity, it might be a more appropriate method for ensuring comprehensive data collection – getting all sides of “the story,” for example, or understanding all the shades of meaning in the answer to a question (Mays & Pope, 2000).

*Respondent validation* involves getting the research subjects’ reactions to the researcher’s output. These reactions are then incorporated into the final research. Although some researchers view this as the strongest available check on the credibility of a research project, there are limitations. For example, research results are often generalizations, integrating the theoretical stance of the researcher with respondent’s specific answers to questions. There are bound to be instances where research conclusions will differ from a respondent’s specific reactions and answers. Instead of thinking of this process as one devoted to checking research validity, it might be more productive to think it as a process of error reduction, which generates more original data for analysis (Bloor, 1997).

*Concise explanation of data collection and analysis* plays a very important role in determining a research study’s reliability and validity. Because research methods inevitably influence the research subjects, it’s fundamentally important to clearly state the process of data collection and analysis. By the end of the research cycle, the researcher should be able to account for the evolution of the simpler classification systems of the research questions into the more sophisticated coding structures of data analysis; and the subsequent development of these coding structures into the clearly defined concepts, explanations, and theories generated by the data.

This written account should give the reader sufficient data and documentation to judge whether the data adequately support the researcher's interpretations.

*Reflexivity* refers to being sensitive to the ways in which the researcher and the research process have shaped the research project, the data, and the generated conclusions. Prior assumptions and researcher experience can significantly affect research outcomes; this is particularly relevant for qualitative research, which attempts to leverage researcher involvement for more comprehensive understanding. For the purpose of credibility, in all research studies, both qualitative and quantitative, should account for the researcher's personal and intellectual biases at the outset of the research project. Topics for inclusion in this account include: the effects of the researcher's personal characteristics (like age, sex, social class and professional status) on the data collected, and the "distance" between researcher and participant.

*Attention to negative cases* is an established method for improving the quality of explanations in qualitative research. Essentially, in this method, the researcher looks for and discusses data points that contradict, or seem to contradict the conclusions being proffered. This "deviant case analysis" helps in refinement of the analysis until it's able to explain the vast majority of cases under study.

Finally, *fair dealing* is a technique that ensures that the research design incorporates a wide range of different perspectives so the viewpoint of any one group isn't ever presented as representative of "the truth" of any situation.

## **Conclusions**

Qualitative research seeks to understand, as completely as possible, the phenomena under study. Ethnographic research has qualitative goals of complete understanding, but interacts with research subjects, in their own setting, to come to that understanding. There are a variety of

methods qualitative researchers use: they collect data through observation, interviews, and data analysis. However, while many in the hard sciences view qualitative research as “easy,” or not rigorous enough, qualitative researchers do in fact strive for reliability and validity in their findings. Observation, if it’s to be systematic and rigorous, is more complicated than simply being present and looking around. Expert interviewing entails more than just asking questions, and content analysis requires a lot more than just reading a text to see what it says. Generating useful and trustworthy research from a qualitative project requires careful planning, discipline, practice, and time. In this paper, I have tried to provide a brief review of the elements that a well-designed qualitative research study must possess.

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