Analysis and Use of Qualitative Data

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INTRODUCTION

Perinatal drug use is a topic of obvious importance to society in general and to clinicians specifically. Despite its importance, myriad questions exist about it, in part because of a relative dearth of research and in part because of the uncertain nature of the information that has been obtained to date.

Questions indicate gaps in knowledge about a phenomenon; "they point either to problematic phenomena, observed events that are puzzling in terms of currently accepted ideas, or problematic theories, current ideas that are challenged by new hypotheses" (Brewer and Hunter 1989, p. 55). Lack of adequate knowledge creates ambiguity or uncertainty that limits understanding of what is happening and consequently restricts the ability to intervene or help those in need. Inquiry is conducted to answer questions and reduce uncertainty. Thus, the intent of inquiry is to produce information relevant to a particular question or uncertainty. Information is contained in any message that reduces uncertainty about a phenomenon of interest (Shannon and Weaver 1949). That is, information is not merely a fact such as an observation or a significant finding; it subsumes the ability to give structure and meaning to the fact, in relation to the phenomenon under examination. For example, treatment of substance abuse is a formidable task, and little if any information is provided by the failure of yet another program unless reasonably precise reasons for the failure can be delineated.

NEED FOR METHODOLOGICAL DIVERSITY

When questions arise, different approaches to resolving them are available. These approaches can be generally classified as empirical and nonempirical. Empirical approaches involve a systematic process of data collection, analysis, and interpretation (Sechrest and Sidani, in press). Data refer to information gathered during an inquiry. These data are then summarized, weighted, or analyzed in a way that allows valid conclusions to be drawn that provide logical explanations of the identified problem, answer questions, and reduce uncertainty. Nonempirical approaches include reversion to authority, revelation, intuition, and logical reasoning.

The extent to which uncertainty is *legitimately* reduced depends on the validity of conclusions. In turn, ascertaining the validity of conclusions

is a difficult, even "uncertain," task (Brewer and Hunter 1989). The uncertainty regarding interpretation of findings stems from the inability to rule out alternative interpretations. Critical rival hypotheses usually cannot be tested when data are collected from only one source, using one method of data collection and reflecting a single perspective. In contrast, the likely validity of conclusions is enhanced when multiple methods of data collection and analysis are used and when alternative theoretical perspectives are represented in an empirical inquiry (Cook and Campbell 1979; Shadish 1993, pp. 13-57; Webb et al. 1981).

Empirical approaches to inquiry include a variety of research designs that often are divided into two broad categories: quantitative and qualitative. Quantitative and qualitative methodologies are likely to differ on several grounds: theoretical perspective, research purpose and design, and methods for data collection and analysis. Some authors claim that the two methodologies cannot be mixed because they are founded on incommensurable paradigms (Denzin and Lincoln 1994, pp. 1-17; Guba and Lincoln 1988, pp. 89-115), but triangulation of research strategies should be sought when an inquiry is conducted; the differences in perspective, data collection, and analysis require that multiple research designs be used when a phenomenon of interest is examined. Information obtained from different sources provides a complementary and comprehensive explanation of what is occurring, thus increasing confidence in the validity of conclusions and reducing uncertainty. However, little explicit attention is paid to the exact methods by which information obtained from diverse sources may be integrated (Dennis et al. 1995).

ADVANTAGES OF TRIANGULATION

Triangulation refers to the use of a combination of methodologies in the study of the same phenomenon (Jick 1979). Triangulation may involve multiple investigators, multiple theories, multiple data collections, multiple measures, multiple analysis methods, or any combination thereof. The assumption underlying this pluralism is that each type of research methodology, whether quantitative or qualitative, has an inherent bias or weakness; however, the biases or weaknesses of research methods are not identical. Consequently, when several methods are used conjointly, the bias inherent in one method may be canceled out by the bias introduced by another. That is, the weaknesses or limitations of one method may be compensated for by the strengths of the other. This balancing at least will be likely if methods or approaches are chosen because they do not share the same biases or weaknesses. For example, when a community-based drug rehabilitation program is being evaluated, teenagers may be asked

to self-report weekly on their drug use, and their friends also may be asked to report on their friends' drug use. The self-reports may be biased toward underreporting; friends' reports should not be biased to the same degree. Still, both groups' reports may be biased toward underreporting compared with results of a urine test. Thus, one advantage of triangulation is reduction of bias. However, elimination of bias requires careful analysis of the sources of error in different methods.

Furthermore, with triangulation, the strengths of one method add to or even enhance the strengths of the other, thus providing complementary information that gives a more complete and comprehensive explanation or picture of the phenomenon under study. For instance, a urine test can determine only whether drugs have been used within a certain timeframe; it reveals nothing about patterns or circumstances of drug use. Other methods of inquiry, including self-report and reports by friends, may be of value in the latter respect.

Thus, a second advantage of triangulation is improvement of the validity of findings. When findings of multiple methods converge, confidence in the validity of conclusions is enhanced; results in agreement indicate that the methods are assessing the same phenomenon and that the unique bias of each method is reduced, if not eliminated. The plausibility of rival explanations of the phenomenon also is diminished because various perspectives are represented in all stages of the research process.

Findings from multiple methods that sharply diverge are as important to the understanding of a phenomenon as convergent ones. Contradictory results provide the researcher with an opportunity to uncover deviant or unexplored dimensions of a phenomenon; identify substantive or methodological sources of divergence, thus enriching the understanding of the phenomenon and potentially leading to synthesis or integration of theories explaining it; and rethink and reanalyze the problem from a new perspective (Brewer and Hunter 1989; Jick 1979; Mathison 1988). Discrepant findings about the effects of an intervention program, such as those that may arise from comparing objective measures with information obtained from clinical interviews, should not be a source of despair but should be regarded as both challenging and useful in defining issues more precisely.

Although advantageous, triangulation should not be applied mindlessly (Patton 1988, pp. 116-137). That is, the decision to use multiple methods should be based on the nature of the problem under study and the availability of measures sensitive to the problem. Planning for collecting data from various sources using different methods is one aspect of triangulation that can be done by researchers to draw accurate

and valid conclusions. Examples of studies in which data and method triangulation were implemented are increasing in number (Breitmayer et al. 1993; Connides 1983; Dennis et al. 1995; Helitzer-Allen and Kendall 1992; Roter and Frankel 1992; Steckler 1989). Both quantitative and qualitative methods of data collection and analysis frequently have been used, thus providing additional empirical support for the complementary nature of the two methodologies and the benefits of data and method triangulation. Using alternative methods for measuring or capturing a phenomenon is useful in identifying the direction of bias, estimating its extent, validating or verifying results, and providing complementary and complete information about the phenomenon (Fielding and Fielding 1986).

VALUE OF QUALITATIVE METHODOLOGY

As stated above, overreliance on only one type of research method may lead to systematic bias in results and therefore threaten the validity of conclusions. Evaluation of drug use prevention, treatment, and rehabilitation programs has relied primarily on quantitative research methods. Although some questions about the effectiveness of such programs have been answered, the uncertainty regarding the validity of conclusions has not been completely resolved because of the potential bias inherent in quantitative research. For example, results of a structured questionnaire administered to subjects who participated in a drug rehabilitation program may indicate that the program was effective in reducing drug use, improving well-being, and helping participants adjust to the demands of the role of teenage mother. Nevertheless, social scientists, skeptical by nature of their training, question the validity of the success of the program. At least two factors might have contributed to observed findings. One factor relates to the data collection method used: self-report. The validity of self-reports is not always maintained: Honesty of participants, social desirability, acquiescence, and clarity of directions, questions, and response options are issues that must be taken into consideration when interpreting results obtained from a structured questionnaire. A second factor relates to the participants' knowledge that they are being studied and their willingness or desire to please the investigator or clinician. In addition, the mechanisms underlying the observed changes in the participants' behaviors might not have been precisely determined; factors other than those theoretically expected might have been responsible and might have led to a "turning point" in participants' lives.

Qualitative methodology offers an alternative to and a complementary perspective of problems addressed in perinatal drug research. Qualitative research is described as "multimethod in focus, involving an integrative,

naturalistic approach to its subject matter. This means that qualitative researchers study things in their natural settings, attempting to make sense of or interpret phenomena in terms of the meanings people bring to them" (Denzin and Lincoln 1994, p. 2). Qualitative methodology differs from quantitative methodology on several grounds, including ontological and epistemological assumptions and subsequent methodological strategies (Bednarz 1985; Bryman 1984; Denzin and Lincoln 1994, pp. 1-17). Although there is not adequate support for some of these distinctions (Sechrest and Sidani, in press), the authors provide a summary of the essential features that characterize qualitative methods because, as discussed in the literature, qualitative data collection and analysis are ingrained and connected to the philosophical assumptions held by researchers.

In general, qualitative research is based on a relativistic, constructivist ontology that posits that there is no objective reality. Rather, there are multiple realities constructed by human beings who experience a phenomenon of interest:

> People impose order on the world perceived in an effort to construct meaning; meaning lies in cognition not in elements external to us; information impinging on our cognitive systems is screened, translated, altered, perhaps rejected by the knowledge that already exists in that system; the resulting knowledge is idiosyncratic and is purposefully and effortfully constructed (Lythcott and Duschl 1990, p. 458).

These constructed realities exist in the minds of the individuals and cannot be broken into parts but must be examined as a whole. Individuals are viewed as open systems, engaged in continual dynamic interactions with their environments, which results in an ongoing evolvement and refinement of their perceptions of reality. To capture these subjective realities that are continually constructed, the "knower" or researcher interacts with the "known" or participants for the purpose of gaining an understanding of the participants' points of view, also called the insider's perspective. Because the insider's perspective is assumed to be evolving, the inquirer aims at capturing this dynamic process that occurs at a specific time and in a specific context. Therefore, many qualitative methodologists assert that investigations should be conducted under natural conditions (Guba and Lincoln 1988, pp. 89-115).

These epistemological and ontological assumptions are translated into distinct methodological strategies. The goal of a qualitative investigation is to understand the complex world of human experience and behavior from the point of view of those involved in the situation of interest. Therefore,

the investigator is expected not to have an a priori, well-delineated conceptualization of the phenomenon; rather, this conceptualization is to emerge from the interaction between participants and investigator. Flexibility in design, data collection, and analysis of research is strongly recommended to gain "deep" understanding and valid representation of the participants' viewpoints. Data analysis is interpretive, guided by the inquirer's insights or intuition in identifying intersubjective, common meanings or regularities—the patterns of observed events. The outcome of this analysis is a rich, often called thick, description and formulation of "working" hypotheses regarding the examined phenomenon (Guba and Lincoln 1988, pp. 89-115; Hughes 1992).

In summary, qualitative methodologies are founded on a relativistic ontology, an interpretive or constructivist epistemology, naturalistic or interpretive methods, and inductive reasoning. Their methodological flexibility of qualitative approaches is valuable when exploring new problems, when observing unanticipated variations in a plan and results, and when evaluating developing programs, that is, at the stage of formative evaluation (Fetterman 1988; Woodhouse and Livingood 1991).

QUALITATIVE DATA ANALYSIS

Despite the commonly held perspective of multiple realities and interpretive, naturalistic methods, qualitative researchers differ in their data analysis techniques. Qualitative research methods include ethnography, grounded theory, phenomenology, feminist research, and critical social theory research. However, feminist and critical social theory research are ideologies more than methodologies in that they have a preconceived sociopolitical agenda, that of raising the "consciousness" of participants toward their current status for the purpose of improving it. As such, these ideologies defy the goal of qualitative methodologies—that of understanding human phenomena from the insider's viewpoint. Consequently, this chapter discusses methods of data analysis that are pertinent to ethnography, grounded theory, and phenomenology only.

Ethnography

Ethnography is defined as "an analytic description of the behaviors that characterize and distinguish cultures or sociocultural groups" (Walters 1980, p. 16). The emphasis is on learning about aspects of life, such as norms, values, and beliefs held by a group of people, and about the nature of behavior and social phenomena observed among members of this group. To achieve a comprehensive, holistic understanding of the sociocultural

characteristics of the study group, the ethnographer "steps in and out of society" (Walters 1980, p. 16): The ethnographer becomes immersed as fully as possible in the participants' world, observing the participants in their natural environment; actively participating, in an acceptable role, in their activities; and collecting verbal or written reports of their perceptions of events. At the same time, the ethnographer, usually an outsider, provides a personal account or interpretation of the participants' world. The ethnographer deals with data from two sources: the participants' accounts of their world and the ethnographer's interpretation of his or her observations.

Transcriptions of participants' interviews are analyzed, using an "emic" frame of analysis. That is, these data are first coded using words given by participants, thus representing their own perspectives. The coded materials are examined for similarities and differences and then sorted by topic. Codes that relate to each other are grouped into categories that illustrate the various domains or topics. Relationships in the data are sought, and a taxonomy is developed to describe the knowledge, beliefs, values, and behaviors of the cultural group under study. Regularities or patterns of observed behaviors and events that emerge from this analysis are used to clarify, extend, and interpret the field notes taken by the ethnographer from observations regarding the meanings and functions of human actions (Atkinson and Hammersley 1994, pp. 248-259).

During the process of data analysis, the ethnographer uses intuition, introspection, and reasoning in finding regularities or patterns of behavior (Burns and Grove 1987). The process of data analysis is facilitated by the ethnographer's (1) familiarity with the participants' vernacular, (2) length of interactions with participants, and (3) degree of participation in the participants' world (Walters 1980, pp. 15-20). These characteristics of an ethnographer are essential for providing a valid and reliable description of the patterns of behavior within the natural setting and from the point of view of the cultural group.

An ethnographic approach is particularly well suited to exploration of treatment milieus that, for example, might exist in a community-based program or therapeutic community. An ethnographer provides a useful account of the customs of treatment groups; the informal, unwritten rules by which they operate; the networks of social relationships and influence; and so on. Such a perspective and description are of great value in understanding how treatment gets done, why it might be more effective for some persons than for others, and how it might be improved—among other issues.

Grounded Theory

Grounded theory is defined as a "general methodology for developing theory that is grounded in data systematically gathered and analyzed. Theory evolves during actual research, and it does this through continuous interplay between analysis and data collection" (Strauss and Corbin 1994, p. 273). Grounded theory is based on symbolic interactionism (Wilson and Hutchinson 1991), an approach to the study of human conduct and a human group's life; it focuses on the meaning of events to people in natural, everyday settings. Symbolic interactionism is concerned with how people define events or reality and how they act in relation to their beliefs. In other words, individuals act toward things—objects, other human beings, institutions, activities, and situations—on the basis of the meanings the things have for them (Chenitz and Swanson 1986). These meanings are created by people from their interactions with their social world. Therefore, the main concern of grounded theory researchers is the discovery of basic social processes, patterns of action and interaction between and among individuals and groups, and the meaning of personal experiences as they are constructed within a specific social and interpersonal context. The emphasis is on understanding the processes, that is, the reciprocal changes in patterns of actions and interactions leading to the individuals' perceptions of events or a social situation. Thus, the purpose of grounded theory is the development of a theory. Strauss and Corbin (1994, pp. 273-284) define theories as interpretations of phenomena made from given perspectives: those of the participants and those of the researchers. Multiple perspectives are sought, analyzed, and incorporated into theoretical conceptualizations of phenomena, bound by time and context. Because the aim of grounded theory is to understand and explain the meaning of experience and behavior as presented by participants, the investigation should be conducted in the "natural setting" where the inquirer can observe behaviors and interactions as they occur. Glaser and Strauss (1966) explained that any observation made is quickly accompanied by "hypothesizing"; that is, the inquirer frames his or her personal account of the observation in the form of an alternative hypothesis. Such hypotheses are generated from an interaction among what is observed, an existing theory or body of knowledge, and the investigator's personal beliefs, meanings, and perceptions. Furthermore, the hypotheses guide the investigator in collecting data, such as by refocusing the topic of the interview; in analyzing data, such as the way data are coded and categorized; and in interpreting findings and integrating them into a meaningful theory.

Data are collected through interviews with participants, field observations, review of documents, or a combination of these. The procedure for sampling participants is purposive or theoretical: Participants are selected who can provide rich descriptions of the experiences under study; they

should be able to articulate their experiences and be willing to give complete and sensitive accounts (Wilson and Hutchinson 1991). In addition, when the inquirer has formulated hypotheses and is seeking their verification, he or she systematically chooses diverse cases and events that represent a wide continuum for the purpose of maximizing similarities and differences of information gained, a step necessary for verifying emerging theories. The diversity and number of participants or events to be selected are determined by the level of saturation of categories. Saturation of categories means that the investigator is not learning anything new from the available data that will substantially modify the concepts and hypotheses reached (Glaser and Strauss 1966). If saturation is high, the investigator will make a decision, based on personal judgment, either to terminate a line of inquiry or to seek a more diverse sample of participants. This characteristic of grounded theory implies that the processes of data collection and data analysis are conducted simultaneously, with one feeding back into the other.

When data are analyzed in grounded theory, the emphasis is on conceptualization rather than mere description. Conceptualization involves some level of abstraction from the observed, the concrete, for defining concepts and relating them in a meaningful way to explain the phenomena under study. Consequently, data analysis proceeds by a continual, reciprocal interplay between concepts and theories held by the researcher and the data provided by participants. This interplay between concepts and data is reflected in a constant making of comparisons (Strauss and Corbin 1994, pp. 273-284). More specifically, the process of data analysis in grounded theory includes:

• Open coding, meaning that labels are selected to represent significant data bits; participants' own words can be used as labels. An alternative method for coding the data is to categorize the data through "themes" that illustrate various aspects of the phenomena described in the data.

• Making notes while collecting data and reviewing interview transcriptions. These notes may be (1) observational—related to events experienced during field work, such as "who said or did what, under which circumstances" (Schatzman and Strauss 1973, pp. 100-101); (2) theoretical—"represent self-conscious, controlled attempts to derive meaning from any one or several observation notes" (Schatzman and Strauss 1973, pp. 100-101; or (3) methodological—"reflect an operational act competed or planned: an instruction to oneself, a reminder, a critique of one's own tactics" (Schatzman and Strauss 1973, pp. 100-101). These notes provide further support for the researcher's conceptualizations of the phenomenon.

- Comparisons of codes and associated data bits to identify similarities and differences, followed by clustering into categories with common ideas.

- Saturation of categories; that is, the investigator accumulates additional examples or data bits related to the category until confident of the meaning represented in specific categories and of the ability to categorize new data bits in respective categories with no hesitation. An abstract definition of the categories, in terms of the qualities or properties characteristic of the category, is helpful for later classification of new data bits.

- Developing linkages or relationships among the categories in the form of hypotheses.

- Identifying conditions under which the relationships hold; this step is facilitated through use of conditional matrices to lay out the findings.

Throughout this process, comparisons are continually made of the codes and categories emerging from the data, the notes made during data collection or analysis, and the sample characteristics (Chenitz and Swanson 1986). The result of this analysis is the development of a theory regarding the phenomena studied. The theory explains a behavior, action, or interaction among individuals, as viewed by participants. Thus, the theory is an "abstraction grounded directly or indirectly on perspectives of the diverse actors [participants and researcher] toward the phenomenon studied . . . . [It] connects this multiplicity of perspective with patterns and processes of action/interaction that in turn are linked with carefully specified conditions and consequences" (Strauss and Corbin 1994, pp. 280-281).

The authors are interested in the phenomenon referred to as the "turnaround" outcome; that is, for a wide variety of troublesome human behaviors, including chronic drug abuse, some individuals seem to be able to turn their lives around—or to have them turned around. These people have not just "improved" to some extent; they have been dramatically changed. How these turnarounds happen is unknown, as is how to make them happen. A grounded theory approach might be exceptionally useful in developing an understanding of this phenomenon.

Phenomenology

Phenomenology is a distinctive philosophy, theory, and method for studying human phenomena, with a focus on the lived experience of everyday life; the unique, personal interpretation of the experiential world; and commonsense knowledge and sense of reality (Oiler 1982). As a

philosophy and theory, phenomenology is based on a well-defined set of assumptions:

- Human beings live in the world, in a specific context that exists as an outside object. They perceive the outside world and interact in it. However, their perception of objects, events, and actions or behaviors is not passive; experience is consciously and actively constituted by individuals (Holstein and Gubrium 1994, pp. 262-271).

- Reality is, therefore, subjective, perceived and interpreted by an individual. The world becomes real through contact with it. In other words, reality is lived, subjective experience. Human beings make sense of the world they see and experience; facts are not taken for granted but are perceived, interpreted, and ascribed meanings. Human actions and interpretations of their experience are guided by a "stock of knowledge" handed down to them through language and cultural and social practices. Stock of knowledge refers to images, ideas, theories, rules or principles, and values, feelings, and attitudes that provide "resources with which a person interprets experiences, grasps the intentions and motivations of others, achieves intersubjective understandings, and coordinates actions . . . . Stocks of knowledge produce a familiar world, one with which [individuals] already seem to be acquainted" (Holstein and Gubrium 1994, p. 264), which is reflected in shared constructs and categories. Nonetheless, people's perceived realities are more important than any objective reality because people act on what they believe (Fetterman 1988).

- Truth is viewed as a composite of the individual's perceived realities. Because these realities derive from the individual's experience, they are based on the person's perceptual skills and preconceived stocks of knowledge. Perceptual skills and knowledge evolve with experience; that is, with acquired experience, perceptual skills and knowledge are refined. Consequently, truth is viewed as constantly changing. In addition, truth is context dependent; it is specific, not universal: Truth stems from interpretation of experience, which is influenced by the individual's background (Dzurec and Abraham 1993).

As a method, phenomenology embraces a holistic approach, meaning that a person is looked at as a whole that is different from the sum of his or her parts. The person's physical, psychological, social, and spiritual aspects are examined simultaneously, in addition to the spatial, temporal, and cultural contexts in which the phenomenon is or was experienced (Oiler 1982). The investigator is viewed as another person who possesses stocks of knowledge and is actively involved in the participants' uncovering of their experiences, interpretations, and meanings. The investigator becomes

part of the social context that influences the construction of participants' realities. Therefore, the uncovered meanings, truths, or realities are the product of the interaction and agreement between the participant and the researcher. Consequently, the task of the researcher is to bring to an explicit level, to describe and understand, the meaning of life or the human experience in everyday activities. However, steps in phenomenological inquiry are not clearly defined. Data collection and data analysis take place simultaneously (Burns and Grove 1987), guided by the following operations:

- *Reflecting* is a method used to attain a rich and comprehensive description of the lived experience. It is achieved through a dialectical process between the researcher and the participant; that is, data collection takes the form of a "conversation," which is an interview with a focus, but not one-sided.

- *Bracketing* refers to the act of suspending or laying aside the investigator's stocks of knowledge and bias regarding the experience being examined (Holstein and Gubrium 1994, pp. 262-271). Bracketing is used during both data collection and analysis.

- *Intuiting* requires looking at the experience from an unrestricted perspective, with an open mind, and setting aside previous knowledge, facts, and theories. It involves examining the experience with a "fresh" look, concentrating on the experience, and "becoming absorbed in the phenomenon without being possessed by it" (Oiler 1982, p. 180).

- *Analyzing* refers to (1) identifying recurrent elements in the experience by comparing and contrasting the descriptions obtained from participants and (2) using the familiar analytic scheme that asks for who, when, how, and why (Oiler 1982).

- *Describing* entails a detailed, comprehensive description of the experience or phenomenon that conveys what has been found or seen and the central characteristics of the phenomenon, also called recurrent themes.

Omery (1983) summarized steps of three phenomenological methodologies originally presented by Giorgi (1970), Van Kaam (1966), and Spiegelberg (1960). Although these methodologies differ in the various steps of the research process, the procedures advocated for data analysis are similar. They include (1) carefully reading transcriptions of interviews, (2) identifying units or categories that reflect the essential constituents of the phenomenon or experience under study, (3) eliminating redundancies in the elements, (4) clarifying the meanings of the elements, (5) relating

the elements to one another and to the experience as a whole, and (6) describing the experience. The essential elements of a phenomenon are identified by intuition, a frequency count, or judges who are expert in the field of phenomenology. The final product of a phenomenological inquiry is a narrative description of the phases of the experience or elements of the phenomenon, within its context.

As an example of an application of phenomenology that might be productive and helpful, the authors suggest the experience of drug craving and attempts at self-control. It is remarkable how little systematic work has been done on drug craving—how it is experienced, what efforts people make to control their urges, what they tell themselves about giving in to those urges, how they deal with the sequelae of relapse, and so on. Phenomenological study is well suited to the sort of "getting into minds" required to achieve depth of understanding of the craving experience and responses to it.

Issues in Qualitative Data Analysis

Qualitative research is, in general, interpretive; it is concerned with the researcher's subjective understanding of a phenomenon, experience, or behavior from the participant's point of view, within a specific natural context. Subjective understanding requires personal contact or interaction with participants, that is, dialectic process, openness, need for setting aside previous knowledge of the phenomenon examined, intuition, creativity, attention to various aspects of the phenomenon (holistic approach), and absorption or submersion in the phenomenon. These characteristics of qualitative data analysis raise two critical issues.

Self-as-Instrument. To gain subjective understanding, the investigator attempts to obtain the trust of and rapport with participants, interviews or "converses" with them to collect data, makes notes of observations and interpretations or hypotheses, manages and analyzes data, and provides a description and interpretation of the phenomenon or experience. Thus, the investigator is the "instrument through which data is collected" (Rew et al. 1993, p. 300), processed, and analyzed. Consequently, data collection and analysis are inescapably influenced by the researcher's own beliefs, perspectives, biases, underattention or overattention to various aspects of the studied setting, selective memory (Firestone and Dawson 1988, pp. 209-221), communication and interview skills, and intuitive and analytic processes. Although the subjective understanding is expected to be reached through the exchange of ideas, interaction, and agreement between the researcher and participant, the researcher should avoid imposing his or her views, should set aside any preconceived knowledge, and should be open, sensitive, and empathetic to the participants'

responses, a task known to be difficult to accomplish. Therefore, qualitative investigators are encouraged to record their own biases, feelings, and thoughts and to state them explicitly in the research report (Creswell 1994). Nonetheless, the extent to which characteristics of the investigator will have played a role in or even interfered in data analysis cannot be known.

Lack of Guidelines for Data Analysis. To understand a phenomenon, experience, or behavior from the participants' point of view, data are collected in an unstructured format that allows participants to freely express their conceptualizations. In addition, data analysis, consisting of data reduction, display, and conclusion drawing, is an interpretive process guided by the available data as well as by the openness, intuition, and creativity of the researcher. Intuition and creativity are "private" processes that are difficult to describe and understand (Firestone and Dawson 1988, pp. 209-221). The process of qualitative data analysis is described as "eclectic," and there is no "right way" (Creswell 1994). Therefore, the conclusions drawn from such an interpretive, intuitive analysis are uncertain, may lack credibility (Miles and Huberman 1988, pp. 222-244), and may misrepresent participants' responses unless researchers describe the method of analysis used and show how the conclusions were drawn from the data "via warrants that are supported by backings" (Lythcott and Duschl 1990, p. 446). The lack of guidelines for data analysis is an issue that needs to be addressed by qualitative researchers because it is a threat to the credibility or reliability (i.e., internal validity) of their investigation and their conclusions.

In addition, explicit methodology for qualitative research is necessary and should be followed with at least as much fidelity as for quantitative research. Claiming to be engaged in qualitative research is no license for doing whatever seems a good idea at the time or whatever an investigator feels like doing. If results of qualitative inquiry are to be credible, they must be buttressed by referencing the best authoritative sources available and by explicit descriptions attesting to the fidelity of implementation of recommended procedures.

Finally, the case for qualitative research often is set forth in the context of world views, ideologies, and even epistemologies that are not necessary foundations for the work. The position can be taken that the meaning an individual attaches to some phenomenon is important in its own right without extending that position to incorporate any further propositions about whether there is any independent reality. Qualitative research may be hospitable to political liberalism, but it does not require it. Qualitative methods are additional tools to the more established quantitative approaches in research and are potentially available to all researchers who wish or need to use them.

CONCLUSIONS

Miles and Huberman (1988, pp. 222-244) summarized qualitative data analysis, using ethnography, grounded theory, or phenomenology, into three activities:

• Data reduction: the process of selecting, focusing, simplifying, abstracting, and transforming raw data

• Data display: assembling information in an organized manner to help understand what is occurring

• Conclusion-drawing and verification: noting regularities, patterns, explanations, possible configurations, causal flaws, and propositions that are verified and tested for their plausibility, robustness, sturdiness, and validity (Miles and Huberman 1988, p. 230)

As described in the literature, these activities rely on the inquirer's subjective understanding, intuition, familiarity with the phenomenon studied or participants' viewpoint, and analytic skills. Moreover, no structured guidelines for describing the process of qualitative data analysis are provided so that researchers are allowed enough flexibility in understanding a phenomenon from the participants' perspective. However, reliance on intuition and lack of analysis guidelines threaten the credibility of conclusions and therefore add to, rather than reduce, the uncertainty regarding the phenomenon studied. Consequently, encouraging qualitative researchers to explicitly describe their analytic processes and to supplement their qualitative analysis with quantitative exploratory analytic procedures, such as cluster analysis, multidimensional scaling, and exploratory factor analysis, will enhance the credibility and validity of their conclusions.

Triangulation is a promising strategy for a cumulative science: using multiple methods for examining its extent, validating results (i.e., convergence), and providing complementary information about a phenomenon (i.e., completeness) (Breitmayer et al. 1993; Fielding and Fielding 1986).

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