

Notes on Linking Qualitative and Quantitative Data

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Qualitative data are becoming more commonly described and used in therapeutic recreation research. The debate of the past concerning whether quantitative or qualitative data are superior has given way to a discussion of how they both contribute to the body of knowledge. Some researchers are considering the possibilities of linking or mixing qualitative and quantitative data types, particularly because of the potential for better understanding the content and process of professional practice. The purpose of this research note is to describe the belief systems and concerns in linking qualitative and quantitative data within a research project. We describe the purposes for using qualitative and quantitative data, the approaches to linking, and the concerns that might be encountered in conducting therapeutic recreation research using linked or mixed data.

KEY WORDS: *Research, Qualitative, Quantitative, Data, Paradigm, Triangulation*

An increase in interpretive research and qualitative studies in the area of leisure has occurred in the past fifteen years. Qualitative data are commonly described (e.g., Dattillo, McCormick, & Scott, 1991; Malkin &

Howe, 1993; McCormick, Scott, & Dattillo, 1991) and used (e.g., Green & Schleien, 1991; Henderson, Bedini, & Hecht, 1994; Hunter, 1987; Pedlar, 1992; Rancourt, 1991) in therapeutic recreation research. In

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addition to the use of "pure" qualitative data, some examples of linking or mixing qualitative and quantitative data are emerging in research applied to practice (e.g., Bedini, Bullock, & Driscoll, 1993; Bullock, Mahon, & Welch, 1992; Malkin, Howe, & Del Rey, 1989; McAvoy, Schatz, Stutz, Schleien, & Lais, 1989).

The purpose of this research note is to use the existing information about qualitative and quantitative data to describe the purposes and problems of linking types of data within a study. Denzin (1978) identified the use of a variety of data sources as data triangulation and the use of multiple methods to study a single problem as methodological triangulation. Our discussion focuses specifically on why and how qualitative and quantitative data might be triangulated, linked, mixed, or combined in a research project. In addition to describing the purposes of mixing data types, approaches to linking and possible pitfalls and dangers in using linked data as a form of triangulation for therapeutic recreation research are discussed.

Researchers and practitioners in therapeutic recreation may be particularly responsive to the potential for linking data for a number of reasons. Linking types of data frequently provides a way to use statistics, known as the traditional language of research, along with anecdotes and narratives which provide further depth in understanding a process or procedure. Additionally, some social interventions, like therapeutic recreation, are so complex that a researcher has to use multiple methods and different data types to find answers to complex problems. Many populations with whom therapeutic recreation specialists work are best understood by using non-traditional research methods and combining the types of data available.

Researchers are committed to seeking understandings through research. A prerequisite to finding truths is to seek quality in research (LeCompte, Preissle, & Tesch,

1993). As in any field, the goal of therapeutic recreation research ought to be to study phenomena as thoroughly, broadly, and deeply as time, energy, and resources will allow. Some researchers in leisure sciences (e.g., Bullock, 1993; Hemingway, 1990; Henderson, 1991; Mobily, 1989) have expressed concern with how traditional, normative, positivist research has served our field. New approaches to data collection and analysis are now emerging. As a result, the discussion about whether the qualitative or quantitative approach is better has become a fruitless debate. Moving beyond this debate, discussions are now centering on the benefits and considerations in using qualitative and quantitative data together within a study.

In initiating this discussion, one of the issues that must be clarified is how paradigms, methods, and data interrelate. A paradigm relates to a worldview or set of beliefs about knowing and discerning what is believed to be "truth." The traditional belief system for quantitative data generally is referred to as positivism (cf. Bullock, 1993; Henderson, 1991). The worldview from which qualitative data have emerged often is called interpretive (cf. Henderson, 1991; McCormick, Scott, & Datillo, 1991) or naturalistic (cf. Bullock, 1993; Howe, 1993). Researchers using positivist or interpretive/naturalistic paradigms are viewing the world differently. These worldviews have a profound impact on research questions asked, methods used, data collected, and the conclusions that are drawn from the research. Although differences exist technically between the words interpretive and naturalistic, the intent of this paradigm is that multiple realities and wholeness constitute reality and emerge from the data in an inductive manner. Within positivism, reality is seen as separated, categorized, and established through deduction and preestablished theory (Henderson, 1991).

Frequently, we talk about qualitative and quantitative methods. As McCormick,

Scott, and Datillo (1991) suggested, methods themselves are not necessarily qualitative or quantitative, but are used to collect and analyze types of qualitative and quantitative data. Methods such as field research and interviewing, for example, may emerge from the interpretive paradigm. The nature of the interview method, however, is determined by whether the data collected are qualitative or quantitative. Generally, researchers collecting qualitative data are operating within the interpretive paradigm, but exceptions might exist such as in the frequent use of focus groups which are generally a highly structured means to collect qualitative data (Krueger, 1988).

For this research note, we prefer to discuss qualitative and quantitative data rather than paradigms or methods. We acknowledge, however, that one cannot isolate data without also considering the assumptions made about the paradigm and the methods of data collection and analysis used. The researcher will have to ascertain how she/he believes "truth" is defined and what it means. As LeCompte et al. (1993) suggested, researchers are concerned with ideas like "how do we know?" and "how do we know we know?" Therefore, the choice of "either/or" or "both/and" concerning qualitative and quantitative data will depend upon the researcher's values and methodological expertise. When data are linked or triangulated, the researcher must be clear about how paradigms, methods, and data relate to one another.

Purposes of Linking

With a paradigm as the basis, the research questions can be developed and the methods selected to collect and analyze data. The usefulness of data rests in the match between the researcher's worldview, the research questions, methods, and the data. Some researchers believe that the positivist paradigm and a quantitative approach to collecting data may be a more effective strategy for questions that require "breadth"

such as discovering cause and effect relationships or determining how much, how many, or how often (Locke, 1989).

On the other hand, interpretive research and qualitative data are ideal for addressing "depth" such as determining why a process had certain effects and for understanding the context and/or meanings of a phenomenon. Qualitative data are useful in capturing the individual's point of view, examining the constraints of everyday life, and securing rich descriptions (Denzin & Lincoln, 1994). Regardless of what the researcher believes truth is, the goal of using any type of data is to obtain trustworthy information that expands the body of knowledge about a phenomenon like leisure behavior or a field of practice like therapeutic recreation.

"Purists," who believe a researcher must operate firmly in one paradigm or another, suggest that the belief systems are so different that any reconciliation between qualitative and quantitative data destroys their underlying foundations (Bullock, 1993; Lancy, 1993). They would argue that the basic assumptions of interpretive research are violated if qualitative and quantitative data are used together.

Other researchers, often called "linkers," however, suggest that the strengths of both qualitative and quantitative data can be enhanced by linking them. Steckler, McLeroy, Goodman, Bird, and McCormick (1992) stated that if we set aside the philosophical debate, we can examine the practical aspects of linking data. Reichardt and Cook (1979) and Steckler et al. (1992) emphasized the possibility of subscribing to one philosophy of a paradigm and employing the methods of the other; each method can contribute based on different, but complementary, assumptions. Generally this linkage will occur within a quantitatively-driven framework because of the nature of determining a priori questions. Steckler et al. (1992) argued further that some social interventions are so complex that a researcher has to use multiple methods and different data types to find answers to complex problems. Thus,

today's practical issue may not be whether to use qualitative or quantitative data, but how to mix them.

Steckler et al. (1992) suggested that both qualitative and quantitative data have weaknesses that can be compensated by using them together. Similarly, Howe and Keller (1988) viewed qualitative and quantitative data as complementary and suggested that users of both types of data can have confidence in their findings increased by linking data types. Data triangulation allows the researcher to accept the assumptions of using both qualitative and quantitative data to create broader perspectives for almost any study. Linking provides a way to generate more information about the breadth and depth of the topic under study.

Fielding and Fielding (1986) cautioned, however, that using these data together should not result merely in a proliferation of data. More information alone is of little use unless the data are appropriately used and discussed together. The value of quantitative data is that they can produce factual, reliable, outcome information which can be generalized while qualitative data generate rich, valid, detailed, process information that leave the study participants' perspectives intact and provide an insider's view to better understand a phenomenon under study. The outcomes of using linked data should reflect the purposes for using data.

Approaches to Linking

Several researchers have described ways that qualitative and quantitative can be linked (e.g., Howe & Keller, 1988; Lancy, 1993; Miller & Crabtree, 1994; Steckler et al., 1992). These combinations generally reflect four major approaches:

1. Antecedent or sequential;
2. Encapsulated or nested;
3. Concurrent;
4. Primary/secondary combinations.

The antecedent or sequential use of data,

which generally refers to using qualitative data first to develop quantitative instruments, offers many benefits. The contributions made by analyzing qualitative data prior to quantitative data collection lie in rationalizing a study and identifying issues that need to be measured. For example, the use of focus groups to begin to narrow a topic and develop questionnaire items is a common antecedent practice (Krueger, 1988). In this case, broad questions are used to develop survey items that can be used to assure greater validity. Austin, Hoge, and Austin (1990) used an open-ended format to obtain information from students about the advantages, disadvantages, or other associations that students saw resulting from serving persons with disabilities in community recreation programs. From these responses, a fixed-format instrument titled the Leisure Service Student Questionnaire was developed.

Encapsulated or nested linkages can provide a conceptual framework for verifying and clarifying findings. Researchers may embed in-depth interviews within a quantitative study to provide a context and check on the validity of quantitative procedures. Qualitative data, for example, can aid in interpreting statistics and deciphering puzzling responses. McAvoy et al. (1989) used encapsulated data in studying integrated wilderness adventure programs. They used structured interviews as a follow-up after pre, post, and follow-up quantitative data had been collected about trait anxiety reduction. Forty individuals from the sample of 121 individuals used to collect quantitative data were interviewed to help the researchers understand the process of how adventure programs can result in attitude and lifestyle changes.

When data collection occurs concurrently and interpretation is done simultaneously, the data can help to understand phenomena to a broader and deeper extent. Bullock et al. (1992) used concurrent data in an evaluation of the Easter Seals' mainstreaming model. To get data about this pro-

gram, consumer satisfaction surveys, provider satisfaction surveys, and indepth interviews with campers, counselors, and service providers were used concurrently. Bedini et al. (1993) administered quantitative questionnaires to students, parents, and teachers along with a content analysis of the implementer's notes and indepth interviews with a subsample of students to measure the results of a leisure education program. The different data sets served to corroborate the outcomes measured with each type of data. Researchers must be aware, however, that sometimes contradictory information occurs in linking two types of data concurrently. The researcher must be prepared for this possibility and will be required to address what the meaning of the contradictions if they arise.

Data can also be used in a primary/secondary combination within a study. In this form of linkage, a study may be primarily qualitatively driven but quantitative data are used for background. For example, quantitative data can be used prior to the collection of qualitative data to determine what representative cases ought to be further explored. The statistics obtained from quantitative data can provide a basis for exploring issues in greater depth through qualitative data. Quantitative information can also provide leads for future qualitative questions, correct the elite bias effect of articulate respondents, and help to confirm hypotheses or themes that emerge from qualitative data. Although neither form of data seemed to be more primary than the other, Malkin et al. (1989) based their selection criteria for open-ended interviews with female suicidal psychiatric patients on the demographic subgroups that were identified through initial quantitative data collection.

Considerations in Linking Data

With the growing popularity of qualitative data collection and the need to understand processes and outcomes of therapeutic recreation from a variety of perspectives, the linking of qualitative and quantitative

data may become more commonplace in therapeutic recreation research in the future. These linkages, however, will result in emerging issues about the trustworthiness of linked data. As researchers and consumers of research, we must realize the privilege and constraints of any type of data. The value of linking or triangulating data lies not only in how they can inform the body of knowledge in therapeutic recreation, but how they may counter reliability and validity problems that can occur in conducting research studies.

Although linking qualitative and quantitative data has benefits, it also has drawbacks. First, problems in linking may emerge related to the roots of the underlying philosophical premises of how we believe "truths" are uncovered in research. Goals, assumptions, and standards will need to be made explicit and negotiated for each study. To link data, the researcher must be able to articulate how the paradigm, research questions, methods, and data complement each other. Sampling may also be a problem in linking qualitative and quantitative data. The researcher will need to sample in a representative way, and must consider and explain carefully how samples are selected methodologically as well as theoretically.

Second, in linking data, many researchers are predisposed to valuing one type of data over another. No problem exists with this bias as long as the researcher can be honest about what he or she is doing. Researchers must be careful not to relegate one type of data to a subordinate role. For example, researchers must avoid perceiving qualitative data as always exploratory, descriptive, or hypotheses-generating with quantitative data being the true test of valid and reliable research. In linking data, one type of data is not necessarily prerequisite or superior to another. In addition, the researcher must keep in mind the level of sophistication possible for data and not oversimplify their uses. A tendency among researchers who are not familiar with the collection of all types of data is to reduce

them to elementary forms (Steckler et al., 1992).

Third and from a practical perspective, linking data will require more time and resources than are generally required when only one type of data is collected. Developing quantitative data collection instruments can be costly and time consuming. On the other hand, although qualitative data may be less costly initially, they are generally labor intensive and time consuming in the long run. Mixing the two may require more resources than if only one is used. Thus, when linking data, the researcher must be sure that adequate time and resources are devoted to data collection and analysis. Further, one of the difficulties in using two types of data is the length of an article that results if all processes and data are thoroughly explained. A fast way to diminish the value of linked data is compromise a study through carelessness or too much brevity.

Fourth, issues will arise concerning how to evaluate studies that have mixed types of data. Theory, design, methods and sampling, and data presentation and interpretation are important for all empirical studies whether qualitative or quantitative data are used alone or are linked. The broad criteria used in evaluating positivistic studies using quantitative methods are enlisted as well as the criteria for evaluating qualitative data. As indicated, the evaluation must assure that data are not presented at an elementary level or that the biases inherent in collecting one type of data affects the other type of data. The researcher needs to explain carefully why and how all data were collected, how the data interacted with each other, and how the researcher interpreted the data.

Conclusions

The purpose of this research note was to describe the purposes, approaches to linking, and concerns in mixing qualitative and quantitative data types within a research project. Most leisure researchers agree that positivist and interpretive paradigms, as well as qualitative and quantitative data,

have contributions to make to the body of knowledge about therapeutic recreation. We now have the potential to take these data types one step further and use them together in sequential, encapsulated, concurrent, and combined ways within a study to obtain both a greater depth and breadth in understanding therapeutic recreation phenomena. In a number of situations, the two types of data can be used complementarily to provide us with greater insights.

As a community of professionals who share a common interest in therapeutic recreation, we will need to support and help one another to develop the best possible studies that use data in both pure and linked forms. In addition, when these studies are reviewed for publication, we will need to be mindful of and consistent in applying criteria related to both quantitative and qualitative data as they relate to linking or mixing data. Researchers and practitioners in therapeutic recreation probably will struggle with some of the concerns that will be raised as more studies use linked data. Some examples of linked data currently exist in the therapeutic recreation research literature; conducting quality studies and using the research results in practice may result in more studies using linked data in the future.

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