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A Conceptualization of Mixed Methods: A Need for An Inductive/Deductive Approach to Conducting Research

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Introduction

The purpose of this article is to give examples of how one can use the research issues and interrelationships between qualitative or quantitative research as a frame for instructing students and judging the quality of research. (The intent is not to present an in depth discussion of the two underlying epistemologies.) Cook & Reichardt (1979) pre-date our work, and like us suggest that the researcher's method can be separated from his or her philosophical perception of the world. In 1980, Patton presented a diagram he called a mixed paradigms. His work acknowledges a qualitative-quantitative continuum, however he only addressed qualitative methods and did not emphasize ways to critique research. Creswell (1994) also discussed qualitative and quantitative approaches, but did not discuss how to critique research. The emphasis of our approach is on validity estimates, also called legitimization techniques, which allows one to estimate and improve the validity of their research, whether it is called qualitative or quantitative. And finally, the emphasis is on the notion of a qualitative-quantitative research continuum, as opposed to a dichotomy, which is more consistent with a coherent philosophy of science.

Quantitative research from a positivistic approach frequently assumes that hypotheses are derived from some theory or hypothetical construct, and are therefore deductive in nature and are sometimes referred to as theory testing. A summary of this concept may be conceptualized as:

Theory -> General Hypotheses -> Specific Hypotheses -> Data Collection -> Data Analysis -> Results -> Conclusion -> Theory Confirmation/Revision.

On the other hand, a qualitative or constructivist approach to research may be considered inductive and the purpose is to generate theory and explanations of phenomena. This can be conceptualized as:

Data Collection-> Data Analysis-> Conclusions-> Development of Hypotheses-> Theory Development.

Obviously, these methods are most appropriate for answering different questions. For example, if your questions are to test differences, to generalize (to infer from the sample

to a population), or to test theory, you are more likely to be doing quantitative research and the research methodology tends to be pre-experimental, quasi-experimental, true-experimental or expost-facto research designs. This would include many path- analytic studies. Some of the assumptions of these methods are that data can be collected value free, there is independence of measurements, and an objective reality exists. Therefore, one can make generalizations.

If the intent is to describe, to uncover deep meaning, to explain, or to build theory, you are more likely to be interested in conducting qualitative research. Generally, research methods associated with these types of questions tend to be case studies or field studies. These methods assume that all data are value laden, context embedded, subjects and objects are dependent, everything is relative, and there is no objective reality. Therefore, neutrality of data is not possible and one cannot generalize.

Quantitative research, from a positivistic point of view, starts with some theoretical or hypothetical construct from which hypotheses are derived. The theory is an outgrowth of qualitative conceptualizations. The point is that one can not do quantitative research that is independent of some previously developed qualitative concepts. While quantitative research, which is based on positivistic philosophy, strives to be objective, it contains many subjective aspects. For example, the selection of an alpha level, directionality of hypotheses, and the interpretation and implication of data all have subjective aspects.

Confusion between "Qualitative and Quantitative Methods" and "Qualitative and Quantitative Research."

There is a frequently held misconception that quantitative research uses numbers and qualitative research is narrative. This is a misleading over simplification. As stated above, qualitative research starts with data, analyzes the data, makes conclusions, and ends with developing hypotheses and/or theory. Exploratory factor analysis, which is a sophisticated statistical technique, starts with the data, analyzes the data, interprets the data (conclusions) and infers the underlying constructs that the set of data is measuring (hypothesized or theoretical underlying dimensions). Therefore, by definition, Exploratory Factor Analysis is isomorphic with the intent and procedures of qualitative analysis. On the other hand, Confirmatory Factor Analysis, which is virtually statistically identical, actually tests to determine if the derived factors fit the hypothesized factors. Therefore, Confirmatory Factory Analysis begins with the hypothesized factors, collects data, analyzes the data, makes conclusions about the match between the observed and hypothesized factors. This is isomorphic with the intent and procedures of quantitative research.

One can also make the same argument for the use of interview data, which can legitimately be used as a data source in qualitative or quantitative research. *The point that is being made is that it is not the technique that makes something quantitative or qualitative, but it is the intent of its uses. Is it testing hypotheses or is it helping to develop hypotheses or describe the data.*

Differences Between Mixed Philosophies versus Mixed Methods

Logically, one can not simultaneously hold two philosophical positions that have contradictory assumptions. This does not mean one can not simultaneously use mixed methods for any particular study.

All research should theoretically or logically be able to be classified as being well done or poorly done. Therefore, a need for standards of quality is necessary. In quantitative research, generally accepted standards for evaluating the quality of research have been presented by Campbell and Stanley (1963) and Campbell & Cook, (1979). These standards relate to the internal and external validity of the research design. For qualitative research, there tends to be less agreement as to what is good research, to the extent that some prominent qualitative researchers, for example, Schwandt (1990), would say that standards are inappropriate. Others might say that good qualitative research is less dependent on the methods and more related to the telling of the story.

Goetz and LeCompte (1982), Newman & Newman (1994), Newman & Benz (1998), Lincoln & Guba (1985), Lincoln (1995), Tashakkori & Teddlie (1998) and Denzin (1994) have supported the need for standards for qualitative research. A list, which should not be considered exhaustive, has been suggested by Lincoln and Guba (1985), and added to by others. This list provides a foundation for developing standards to evaluate the quality of qualitative research in a way that is similar to the Campbell and Stanley criteria for quantitative research.

The Campbell and Stanley criteria for quantitative research include:

Threats to Internal Validity. History, Maturation, Testing Effects, Statistical Regression, Experimental Mortality, Selection Bias, Instrumentation (Content, Expert Judge, Face, Concurrent, Predictive and Construct Validity, Test-Retest Reliability, Equivalent Forms, Internal Consistency).

Threats to External Validity. Interaction of selection and treatment, Interaction of setting and treatment; Interaction of history and treatment; Reactive arrangements, etc.

For qualitative research there are 15 criteria suggested mainly by Lincoln and Guba (1985). These are: Neutrality, Prolonged Engagement, Persistent Observation, Peer Debriefing, Triangulation, Member Checking, Structural Relationships, Theoretical Sampling, Audit Trail, Negative Case Analysis, Thick Descriptors, Referential Adequacy, Overlapped Methods, Step-wise Replication, and Reflective Journal Writing.

There are many well understood examples demonstrating the use of Campbell and Stanley criteria for evaluating

quantitative research but there are fewer examples demonstrating the application of the above considerations to qualitative research. Therefore, what follows is an example of how one can use qualitative criteria in a similar manner to help evaluate the quality of qualitative research. The example comes from an article critique by Newman & Benz (1998) of a case study of the aftermath of a student's suicide at a middle school. It concludes with a heading called Reflections, which is a section that asks the person critiquing the article to suggest what could or should be done quantitatively, following the qualitative analysis. The critique addresses the author's use or lack of use of the several qualitative methods listed.

Neutrality. Since there was one observer and there was no attempt to control for subjective perceptions and personal biases, it is our estimate that this article was weak in the neutrality criterion.

Prolonged On-Site Engagement. The researchers met this criterion since the author /researcher was a counselor on-site prior to the suicide and for at least 12 weeks following the suicide.

Persistent Observation. The author infers that there was an increase in suicide ideation after the suicide incident. However, there was no pre-assessment of suicide ideation and no attempt to collect data on which these inferences could be made. Therefore, it is assumed that this criterion is weak or was not met.

Peer De-briefing. Peer debriefing is defined as the researcher conferring with another professional to get another perspective on what he or she saw or experienced to get another perspective. According to the data presented in the article, there appeared to be no attempt to confirm perceptions and interpretations with other psychologists, counselors, social workers, or any other mental health workers.

Triangulation. It did not appear that there was any attempt to tap information from other sources such as mental health records, school records, parents, etc.

Member Checking. Based upon interviews with students the counselor identified emerging themes that she did not proceed to check in any consistent fashion.

Structural Relationships. There was a minor attempt to explain some of the behaviors of students from a Gestalt theoretical perspective. However, the author did not interweave different data to develop the theoretical (structural) conceptualization.

Theoretical Sampling. There was no attempt at soft hypotheses testing. That is no hypotheses were developed based upon the existing data, and no additional data was collected to determine if hypotheses were supported.

Leaving an Audit Trail. It is possible that the short format of the journal article did not allow for presentation of all data sources. Only the author's subjective perceptions were presented.

Generalizability. Appropriately there was no attempt in this article to generalize. The author was poor in providing deep descriptors, that is detailed descriptions of the subjects, situation, and the culture of the school. There also appeared to be no attempt at negative case analysis, that is there was no attempt to explain outliers from their particular perspective.

Truth Value, Credibility, Confidence In the Research. The stated purpose of the article was to demonstrate the effectiveness of a Gestalt therapeutic approach in helping student suffering from trauma do to a peer's suicide. Based upon the above criteria, it would be difficult to conclude anything about the relative effectiveness of the Gestalt approach.

Reflections. Using the qualitative/quantitative interactive continuum as a guide (Newman & Benz, 1998), one could use the themes that emerged from this qualitative case study to develop a quantitative study which would determine if the relationships that emerged through the qualitative theory building process do exist, and if the results that were theorized can be generalized. Future research could evaluate the effectiveness of treatments by randomly assigning students to different treatment groups such as Gestalt, behavioral, psychoanalytic, etc. This quantitative procedure would then build on the heuristic and descriptive qualitative findings to enhance the researcher's ability to estimate the effectiveness of a particular treatment.

Conclusion. As stated in Newman and Benz (1998) and supported by the review of the literature presented by Gueulette, et al.(2000) much of all research tends to be blends (mixed models, qualitative/quantitative). Researchers need to recognize that to build knowledge for any discipline or field one must be willing to use both quantitative and qualitative methods as appropriate. As Newman and Benz indicated, each approach can provide insights on which the other methods can build (reflectiveness).

It is difficult to think of doing a quantitative study without making a significant number of qualitative judgments. To the extent that researchers are aware of this, the more likely it is that standards of effective research can be established. This acceptance of the need for both conceptualizations will decrease wasted time that is spent in arguing about a dichotomy that is neither fruitful nor effective. The emphases should be on identifying and clearly stating the research questions of interest and the most appropriate methods for answering those questions. This requires researchers to know the strengths and weaknesses of each.

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