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AUTHOR	Bair, Carolyn Richert
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ABSTRACT

This study describes the use of meta-synthesis to review a large body of research literature and systematically synthesize the findings in an effort to develop a more informed understanding of a particular area of interest. Sections of the paper review similarities and differences among meta-analysis, meta-ethnography, and meta-synthesis; review a number of prior studies which integrated both quantitative and qualitative research; discuss significant factors to be considered in a meta synthesis approach to inquiry; review sample selection and data collection; analyze the data and test it for validity; note research used and the time frame of the study; and list the five different types of research studies--quantitative descriptive research, correlational research, criterion group research, experimental/quasi-experimental research, and qualitative research--selected for this meta-synthesis. The paper concludes that this approach can provide new information, understandings, interpretations, and meanings useful for faculty, researchers, and policymakers. (Contains 30 references.) (CH)

Meta-Synthesis

Carolyn Richert Bair
University of Northern Iowa

Paper prepared for presentation at the
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Headquartered at the University of Missouri-Columbia • College of Education • Department of Educational Leadership and Policy Analysis • 211 Hill Hall, Columbia, MO 65211 • 573-882-9645 • fax 573-884-5714

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Meta-Synthesis

Carolyn Richert Bair, Ph.D.

Introduction

> Given the cumulative nature of science, trustworthy accounts of past research form a necessary condition for orderly knowledge building. Yet, research methods textbooks in the social sciences show a remarkable lack of attention to how an inquirer finds, evaluates, and integrates past research. This inattention is especially troubling today because the social sciences have recently undergone a huge increase in the amount of research being conducted. (Cooper, 1984, p. 9)

Over the past quarter century, tremendous gains have been realized with respect to how research is conceptualized and designed, how data are analyzed, and the sheer volume of research results being reported. Technological developments in computer science are partly responsible for a growing complexity in research design and analysis and for the volume of research being produced. As an example, through the use of causal models, brought within easier reach by software programs, researchers have been aided in addressing issues of magnitude. Microcomputer software programs have made possible sophisticated analysis of data at low cost and maximum ease of use to individual researchers, freeing time for researchers to focus on design and data collection.

The increasing popularity of qualitative inquiry has added to the complexity and to the volume of contemporary research, as well. Further, it has brought into focus underlying meanings -- the "why," "how," and "what for" of social phenomena.

Although science is cumulative by nature, the past quarter century has been unusual because of the rapid accumulation of research studies made possible through both technological advances and changes in inquiry. One of the challenges now facing scientists, educators, and practitioners is to make meaning of the vast array of studies available on any given topic. In this paper I describe a qualitative research methodology, meta-synthesis (Bair, 1999), through which findings from multiple studies or from a large body of research can be combined. The process for conducting a meta-synthesis of research is detailed.

Development of the Methodology

While conducting a literature review for my doctoral dissertation, I noted that there is a broad, diverse, and inconsistent research literature on my topic, doctoral student attrition and persistence. Numerous studies had been completed on the topic at many types of institutions of higher education and in different fields of study through the use of both quantitative and qualitative approaches, all seeking in some way to explain the same phenomena. These studies had been conducted in isolation of each other and were rarely nationwide nor longitudinal in design. After they were completed, they remained largely in isolation of each other in the research literature. Using meta-synthesis as my methodology, I removed studies from isolation and systematically synthesized their findings in an effort to develop a more informed understanding of my area of interest. The approach bears some similarities to meta-ethnography (Noblit & Hare, 1983, 1988) and to meta-analysis (Glass, 1976, 1977). However, there are key differences among the three methodologies.

Meta-analysis, Meta-ethnography, and Meta-Synthesis

It is difficult to extract accurate, meaningful, and comprehensive information from a large number of studies on a selected topic without the application of rigorous research procedures, and researchers within the past 30 years have developed research syntheses as credible methodologies upon which to rely for the combination of multiple research studies on a similar topic. Two distinct types of research have heretofore been introduced and developed in detail -- meta-analysis and meta-ethnography.

Researchers who seek to complete syntheses of research studies using quantitative approaches and data from quantitative research studies find meta-analysis to be their methodology of choice. Glass formally introduced meta-analysis to the behavioral and social sciences in the mid-1970s (Glass, 1976, 1977). In meta-analysis, results of quantitative studies are statistically combined. It is used with survey, correlational, experimental, quasi-experimental, and regression analysis research studies (Cook, et al., 1992). The process involves the selection of multiple studies on a similar topic and the synthesis of individual data points (usually effect sizes, or

standardized mean differences) from across those studies. An average of the effect sizes is calculated. In this way, the findings of each study are represented through a common metric, usually standard deviation. This measure of central tendency is on a continuum; therefore, the researcher can calculate the extent to which an item or multiple items in the studies vary in magnitude of effect. Meta-analysis is a reductionistic research approach in the positivist tradition (Glass, 1976, 1977). It is particularly valuable for combining evidence from multiple studies on a single topic using a statistical approach. As such, it establishes whether results across studies are significant or not, and it identifies "outliers" among the studies. It also holds some promise for generating new research questions. Meta-analysis has been used most widely in medical and psychological research. Quantification of research evidence distinguishes meta-analysis from meta-ethnography and from meta-synthesis (Olkin, 1990). Meta-analysis is also distinguished by its focus on methodological rigor. Numerous books and articles have been written on meta-analysis, detailing the phases of the research process (problem formulation, sampling, data evaluation, data analysis, and reporting) and setting methodological standards for its use (Cooper & Hedges, 1994; Glass, 1976, 1977; Rosenthal, 1984).

In contrast to meta-synthesis, meta-ethnography is used by researchers who are interested in synthesizing findings of multiple ethnographic studies. Introduced by Noblit and Hare (1983, 1988), meta-ethnography involves "a rigorous procedure for deriving substantive interpretations about any set of ethnographic or interpretive studies" (Noblit & Hare, 1988, p. 9). Meta-ethnography involves the summary, interpretation, and translation of published field studies into each other (Noblit & Hare, 1983). It goes beyond a single case study, discourse analysis, narrative, or other ethnographic study in order to examine multiple accounts. Because ethnography is focused on understanding how individuals make sense of certain realities within a given context, the researcher is engaged in the process of seeking key metaphors or themes. The meta-ethnographer reviews texts of studies, relying on notes, matrices, and descriptions in constructing interpretations and in synthesizing understandings from multiple studies. As texts are compared, new interpretations are formed, going well beyond what is usually done in a review of

the literature (Noblit & Hare, 1988). The data management techniques of Miles and Huberman (1984/1994) are useful in the process of analyzing materials in meta-ethnography in order to increase the reliability and validity of conclusions (Huberman & Miles, 1994). Meta-ethnography is an integrative and interpretive approach in the phenomenological tradition. Its usefulness was described by Noblit and Hare (1988) as follows: "It will be of most interest to social scientists who struggle to 'put together' the many qualitative studies now being produced, to the researcher or student who wishes to construct interpretivist literature reviews, to policy researchers and policymakers who wish to use humanistic research in their deliberations but who are at a loss about how to 'reduce' it, and to qualitative researchers concerned with interpreting multiple cases and/or alternative lines of argument" (p. 10, 11).

Whereas meta-analysis is a quantitative methodology applied to quantitative research studies, and meta-ethnography is a qualitative methodology used with qualitative research studies, meta-synthesis is a qualitative methodology that uses both qualitative and quantitative studies as sources of data. Like meta-ethnography, it is an integrative approach in the phenomenological, or interpretive, paradigm of naturalistic inquiry. It is concerned with understanding and describing key points and themes contained within a research literature on a given topic. However, it differs from meta-ethnography, in that it synthesizes studies from both qualitative and quantitative research. As such, it fills a void in research methodology.

Meta-synthesis is qualitative by design, in that it is not technically possible to synthesize data from both quantitative and qualitative studies using a quantitative approach due to the absence of a common metric in qualitative studies. Qualitative research as an approach is particularly desirable for meta-synthesis, in that it views and seeks to "describe and understand phenomena as wholes, or at least in ways that reflect their complexity" (Guba, 1978, p. 14). It is integrative and expansionistic, in that it seeks to compare and analyze many studies together in a constructivist way, allowing interpretive themes or key metaphors to emerge and build from the synthesis. Ward (1983) has said "synthesis can be used to refer to all efforts to relate knowledge, including previously unrelated or contradictory knowledge, and to show it is relevant to a specific

situation or topic" (p. 26). Interpretation and induction are essential tasks of qualitative research synthesis (Noblit & Hare, 1988).

The methodology of meta-synthesis has similarities with meta-ethnography, since both are integrative approaches in the phenomenological tradition. Meta-synthesis stands in contrast to meta-analysis, however, insofar as little emphasis is placed on the reduction of data from multiple studies in meta-synthesis and more emphasis is given to interpretation and to building toward new understandings. In much the same way as "meta-ethnography synthesizes the substance of qualitative research, and meta-analysis synthesizes the data" [of quantitative research] (Noblit & Hare, 1988, p. 81), meta-synthesis integrates the substance of both qualitative and quantitative research studies on a selected topic.

Antecedents of Meta-Synthesis

The qualitative integration of both quantitative and qualitative research is not entirely a new phenomenon. Studies involving a type of research review and synthesis have taken place over time and under a number of rubrics by researchers seeking to satisfy a variety of research purposes. Some of the terms used variably and sometimes interchangeably to describe the qualitative synthesis of both quantitative and qualitative research follow:

Narrative review of research (Cooper, 1982; Crismore, 1985)

Narrative explanatory synthesis of research findings (Light & Pillemar, 1982)

Qualitative research integration (Guskin, 1984)

Qualitative meta-analysis (Crismore, 1985; DeWitt-Brinks & Rhodes, 1992; Miller, 1993)

Qualitative research synthesis (Falchikov & Boud, 1989; Hossler & Scalese-Love, 1989)

Qualitative meta-evaluation (Hager & Hasselhorn, 1998)

Research synthesis (Cooper & Hedges, 1994)

Explanatory literature review (Pascarella & Terenzini, 1991)

Narrative literature review (Light & Pillemar, 1982; Pascarella & Terenzini, 1991)

In addition, Cooper (1984) has used the term "integrative research review" as a form of literature review, and Hossler and Scalese-Love (1989) introduced the term "grounded meta-analysis" with reference to the development of grounded theory.

Such an array of terms points to the need for consensus and focused direction with regard to the practice of the qualitative research synthesis of studies conducted using both the qualitative and quantitative studies as data sources. Without a research model specifically detailed as a means for the synthesis of past research from both qualitative and quantitative studies, the problem of terminology is likely to continue. More importantly, a research method is likely to be further discussed, developed, and refined once it has been established and described. I have proposed meta-synthesis in order to fill my own research needs and to provide a title, concept, and process available for future use by other researchers. Guba (1978) wrote that it is desirable to enlarge the number of "investigative strategies for dealing with emergent questions of interest" (p. 24). This particular strategy addresses the accumulation and the volume of research literature on many topics and becomes a way to make further meaning and create further understanding of that research.

Research synthesis has gained acceptance in recent years, as exemplified by the development and elaboration of meta-analysis and meta-ethnography. Meta-synthesis, qualitative "cousin" of both meta-analysis and meta-ethnography, was developed to provide for the systematic review and synthesis of quantitative and qualitative research that is replicable, that has discovery as its aim, and that is emergent and variable in its design. Meta-synthesis may assume a position alongside meta-analysis and meta-ethnography, filling a void and adding to the range of meta-research approaches.

Meta-Synthesis: Approach to Inquiry

The research approach of meta-synthesis springs from the phenomenological, or interpretive, paradigm of naturalistic inquiry (Guba, 1978; Noblit & Hare, 1988) and is thus aimed at scientifically describing, understanding, and integrating materials that have already been published on a topic of interest. This research is interpretive, in that it explains social/cultural

phenomena; it is based upon data that have been gathered from individuals in myriad ways and are contained within the texts produced by the authors of those studies. By inscribing the interpretations that other authors have created and by providing a system through which themes can develop in textual analysis, I sought to create a reading of an aspect of culture through my work on the topic of doctoral student attrition and persistence. Meta-synthesis was designed to "make sense of an object of study ... to bring to light an underlying coherence," thereby creating an understanding of doctoral student persistence or non-persistence to the degree (Taylor, 1982, p. 153).

Through meta-synthesis, data on a selected topic are identified, retrieved, organized, and indexed, after which they are systematically analyzed. In qualitative synthesis, multiple studies are translated into one another's terms (Noblit & Hare, 1988). The approaches used in these studies, the scope of the investigations involved, the content and descriptions of the findings, and the conclusions of the studies are the focus of meta-synthesis. Meta-synthesis examines ideas, mind-sets, and approaches, as well as conclusions reached and findings elaborated in the results of studies. It attends to words and ideas, going well beyond a counting of occurrences or of specific findings.

Consonant with phenomenological/interpretivist inquiry, I used an emergent, variable research design for my study, as to attempt to specify the design in full detail could have constrained the complexity of the information-building process (Guba, 1978). As studies were reviewed, ongoing decisions were made regarding data recording and management (Miles & Huberman, 1984/1994). Specifically, ongoing decisions were made as to data selection, condensation, display, observation of patterns, and the drawing of conclusions. This emergent design was particularly useful in a synthesis of studies on doctoral student attrition or persistence, where texts were analyzed and integrated and, in the process, new interpretations were created (Noblit & Hare, 1988). Meta-synthesis as a research approach requires the identification of research questions. Such questions broadly guide, but do not restrict or confine the study. Research questions were stated in broad, general terms so as to allow patterns and understandings

to build (Lincoln & Guba, 1985). The research questions for my study on doctoral student attrition and persistence are contained on page 7 of my dissertation (Bair, 1999).

Sample Selection and Data Collection

Studies to be used in a meta-synthesis must be selected based on specific criteria; however, the total number needs to remain open to allow for the addition of studies as the research continues. The researcher specifies how and why selections the are made. As an example, in my meta-synthesis, I limited the selection to relevant studies from the period 1970-1998 and then selected individual studies based on whether or not they met five general criteria.

Because my inquiry was a critical examination of research studies on doctoral student attrition and persistence, my sample selection focused on how to choose those studies that would be used in the analysis. Those studies became the data for my research study. I had already completed a comprehensive review of the literature, through which I gained an understanding of the topic and made a listing of studies for possible use. Noblit and Hare (1988) have cautioned against an exhaustive sample or an attempt to locate all studies: "Unless there is some substantive reason for an exhaustive search, generalizing from all studies of a particular setting yields trite conclusions" (p. 28). Rather, they have suggested including those studies that appear to be relevant, credible, and interesting. Noblit and Hare likewise suggest that researchers ask what can be learned from translating each study selected into each other study selected when choosing sources for inclusion. I chose to not incorporate those two recommendations into my study on doctoral student attrition and persistence.

For this particular research, I was interested in general findings about doctoral student attrition and persistence in recent years. Therefore, I limited my selection to relevant studies from the period of 1970 to the present (1998). These were selected from various sources, including published articles, books, dissertations, papers presented at national conferences, reports, theses, and unpublished studies. In keeping with Mullen and Rosenthal's (1985) recommendation of using the full range of sources in order to have a more complete and accurate study, I used several

electronic databases to identify as many studies as I could find between 1970 and the present. Additionally, I relied upon various other approaches to identify studies, including the "descendency approach" of using direct indexing sources, such as Books in Print and university on-line indices; "abstracting services" such as Psychological Abstracts, Sociological Abstracts, and Dissertation Abstracts; "on-line computer searches" such as ERIC and Psych Info; "proceedings from conferences"; the "ancestry approach" of following bibliographies back to earlier studies; and the "invisible college approach" of corresponding with researchers directly (Mullen & Rosenthal, 1985, p. 17).

Once studies were identified and read, I made determinations regarding whether or not they fit the general subject area of doctoral student attrition or persistence. This included a consideration of one or more criteria, such as:

Studied attrition and/or persistence of doctoral students

Specified (individually or in any combination):

- Type of institution
- Field of study
- Number of individuals in the study
- Number of institutions in the study
- Programs included
- Description of participants
- Assignment of participants
- Size of program (cohort); program factors
- Interactional factors (such as student-faculty and student-student)
- Demographic items such as race, age, and gender
- Academic factors such as GRE, GPA, and prior degree
- Points of departure, if dropped out
- Individual variables (such as age, race, and gender)
- Finances; economic factors

Teaching/research assistantship

Employment during doctoral studies

Psychological factors (such as motivation and self-concept)

Organizational (institutional) factors (such as orientation)

Geographic location of study

Other variables

Methodology used in the study

Date of publication of study

Publication form

Coherent findings

When I chose not to include a study in the meta-synthesis, my decision was based on one or more specific reasons, including:

1. The study was conducted prior to 1970. This date was selected with three objectives in mind. First, studies prior to 1970 are more difficult to locate, especially those contained in conference proceedings and those obtained through contact with the researcher. Second, changes in research methodology that resulted from the development of microcomputers and statistical packages began at approximately that time, and the studies following 1970 began to reveal the influence of those developments. Finally, I needed to have a way to limit the number of studies in the meta-synthesis through a practical and fairly neutral criterion.

2. The study was conducted in such a way as to not produce clear and understandable findings.

3. The study did not separate "doctoral" from "graduate" students; those studies in which master's degree and doctoral degree students were combined were rejected.

4. The study attempted to understand persistence or attrition from the perspective of currently-enrolled doctoral students.

5. I was unable to obtain a full copy of the study.

In light of these criteria, I identified 430 research studies for possible inclusion in my meta-synthesis and eventually included 118 in the final sample. The vast majority of studies excluded were those written prior to 1970. Approximately one-tenth of the studies that were not used were excluded for reasons 2, 3, 4, and 5, above.

These procedures, centered on study retrieval, make replication or verification possible, should other researchers be interested in further work in the same area. It is important to maintain detailed records of how the retrieved studies were identified, what decisions were made about whether or not studies should be included, and the number of studies identified versus the number of studies used.

Data Analysis

Inductive and integrative approaches were used in the analysis of the data. This section details the four-step process which I used to collect and analyze data. These procedures are similar to those used by Noblit & Hare (1988), and they are heavily influenced by Miles and Huberman (1984/1994) and Huberman and Miles (1994).

1. The first step was to gather and read the studies. Many of the studies were very long and detailed, particularly the dissertations. I read the studies and created a summary of each using a large (11" x 17") summary sheet on which pertinent information was recorded in columns. Special attention was focused on the purpose of each study, the methodology employed, the results, and the author's conclusions. This summary was carefully detailed and contained the following categories of information:

author(s)

title of study

source/citation

date of study

descriptions of the study's participants

institution(s) represented

type of study (design, methodology, analysis)

instrument(s) used (survey, interview protocol, institutional data)

findings regarding rates of attrition/persistence

what the study looked at; variables and questions studied

findings/results related to persistence/attrition

limitations of the study

future research recommended

"also"

Because studies were systematically read and recorded in this way, pertinent information was then available in summary form for my use in the integration and synthesis of studies. For example, when undergraduate grade-point-average and its relationship to doctoral student attrition/persistence was later reviewed, I was able to compare the studies that looked at this particular item. Were they similar studies in terms of methodology employed? Who were the participants? What characterized the institutions represented in the sub-sample for this particular object of study? Additionally, during this first step, I looked for quotations that I thought might provide interesting examples or perspectives from the researchers of the studies. These I noted on the reverse side of the summary page so that I would have later ready access to them.

2. After all of the studies were read and summarized, I began the second step. Noblit and Hare (1988) refer to a similar process in their work, that of "determining how the studies are related" or putting the studies together through discovering the relationships that exist between them. In this step, a second level of recording of information took place. I created another summary sheet, this time a matrix of information (Miles & Huberman 1984/1994) for each general category of key findings. The matrix was designed to lift information that related to a category of key findings (such as "financial assistance" and its relationship to persistence/attrition) from the summary page and record it on the matrix along with information from the other studies that looked at the same category. In this way, the matrix provided a written summary of key findings across studies. The categories of information recorded from each study to the matrix generally included:

Author

Date

Institution(s) included

Fields of study

Type of research study; methodology used

Findings (related to that category of information)

Sometimes the above were changed slightly to accommodate the category of information. For example, when recording the findings of multiple studies on undergraduate grade point average and its relationship to completion of the doctorate, I used two columns for findings and separated the findings by whether statistical significance was or was not found. However, for most categories of information, the matrix described above was used.

The matrices may also be thought of as a way to record the weight of the evidence for a particular item of study, if indeed weight of the evidence is used. Calculating weight of the evidence introduces a quantitative element to the study, and some researchers following a qualitative methodology might not be comfortable with this measure. I did use weight of the evidence in my study. Pascarella and Terenzini (1991) also relied upon weight of the evidence in their extensive research-synthesis study of the impact of college on students. Guba (1978) has written that the number of times a particular concern or issue is raised is not alone a sufficient reason to assign it priority, but that "surely one would not wish to eliminate an issue or concern that received frequent mention" (p. 55). Because the matrices that I used summarize by category of finding, they did reveal the total number of studies in the sample containing information in that category.

3. The third step was that of "translating the studies into one another," for which Noblit and Hare (1985) have recommended thinking in terms of analogies (i.e., study #1 is analogous to study #2 in the following ways, and differs in the following ways). This may be thought of as one stage in which the "synthesis" of meta-synthesis occurred. The results of the studies were juxtaposed, cross-compared, and integrated, so that key concepts and themes of one study could

be seen in terms of the key concepts and themes of all other studies in the sample. The matrix became particularly helpful in this process, in that it visually depicted common findings, similarities, contradictory findings, as well as contained them in written form. It provided the information for cross comparisons among the studies with regard to sample, fields of study, methodology and findings.

An example of this step is evident with regard to the emergent theme "motivation." As I was doing the readings and preparing the summary sheets, I began to see that the term "motivation" was appearing quite frequently. When I developed the matrices containing general categories of key findings, I entered results from all studies in the sample that had to do with motivation on the matrix entitled "Personal Characteristics," along with the other personal characteristics that emerged from the research literature. After that process was completed, I could review the matrix and look only for entries having to do with motivation. I used color-coding to highlight the many entries for each category of information. In so doing, I found that roughly one-fourth of the studies had included "motivation" in some way. It was at that point that I was able to begin to actually translate the studies into each other with regard to motivation and to see how they were related. Were there similarities, commonalities, or contradictions across the studies? Did certain types of studies find one result while others found another? What could be seen about motivation in one study and how did that relate to other studies in the sample? What was revealed in the cross comparisons when types of programs, fields of study, or universities were the focus? Was there information that could be gleaned with regard to the weight of evidence?

4. The fourth step was that of "synthesizing translations" (Noblit & Hare, 1988). This means translating the translations and is certainly another area in which synthesis occurred. In this large study, numerous findings were discovered, and these were then compared in order to see them in relationship to each other. In this final step, the conclusions and insights from the study were incorporated and a discussion of the findings written. An example of this step is once again from the category called "Personal Characteristics." This is a category of analysis that was

included in this study despite the relatively small number of studies conducted on each of the personal characteristics. The importance of this category rests in the fact that researchers have only recently begun to look within the individual, rather than outside the individual, for clues to attrition and persistence. "Translating the translations" was the step in which this level of analysis took place. Themes were looked at in terms of other themes; themes were also evaluated in terms Guba's (1978) considerations for the evaluator to use in prioritizing the categories of information that emerge during qualitative evaluation. These are salience or weightiness, credibility, uniqueness, heuristic value, feasibility, special interests, and materiality (p. 55-56).

Through cross comparisons of the results of multiple studies, generalizations did emerge, as did a greater understanding of the importance of categories of findings. In this final analytical step, the focus was on the whole -- or, more accurately, on what could be said about the whole, based on the study of its parts (individual studies and individual categories of information).

Validity

Trustworthiness has gained increasing currency as a useful concept within qualitative research. Trustworthiness, or validity, is established through confirmability, credibility, and transferability (Lincoln & Guba, 1985). Although my meta-synthesis differs from other forms of qualitative research, attention was nonetheless given to techniques and methods that would help to establish trustworthiness, or validity. In a study using another qualitative approach, confirmability might refer to prolonged, persistent observation. Confirmability in my meta-synthesis, which does not rely on observation, instead comes through the thorough gathering of findings from a large number of studies that involved varied methodological approaches, settings, and fields of study. All available studies that met the criteria for inclusion in the meta-synthesis were used, and the research findings were carefully read and recorded on a summary sheet and a matrix.

Credibility, or believability, of the findings was addressed through the use of an external auditor (a colleague) who was asked to read and review selected articles, notes, and summary pages to ensure that there was essential agreement between the researcher and the external

auditor on the information being recorded from the research studies to the summary (Janesick, 1994). The external reviewer examined three studies and summary sheets and essentially corroborated my findings. Transferability of findings, while it does not correspond to a specific technique within this study, may exist inherent in the structure of the study. That is, given the large number of studies extending over a 28-year period of time, transferability (meaning the similarity between the study's findings and what exists in the real world) may be a built-in feature.

Limitations of the Study

The most obvious limitation of a meta-synthesis of existing research is that the data are limited to those research studies selected for inclusion. Because of this, even though patterns and greater understandings may emerge from the analysis of the data, there still exists the possibility that factors associated with a doctoral student's decision to persist or to drop out have yet to be identified. Even though meta-synthesis holds the power to transcend simple interpretation through the integration of multiple studies, it is nonetheless limited to the findings of the studies at hand.

A second limitation, also related to the original research, has to do with the quality of the initial research. In this meta-synthesis, studies were not excluded based on quality, with the exception of those that did not produce clear and understandable findings. Therefore, because a broad range of sources has been included, some of those studies could be questioned with regard to quality.

Mullen and Rosenthal (1985) have described a further limitation, which they call the "file drawer" problem (p. 17). Rosenthal (1984) estimates that only 5 per cent of studies with significant results are published and 95 per cent of studies have non-significant results and are relegated to a life of storage in a file cabinet. The tendency of quantitative researchers to publish primarily those studies that have statistical significance skews the body of research that is readily available to the meta-researcher. This phenomenon would be much less likely to occur in the research studies that are qualitative, in that statistical significance is not a defining characteristic of

qualitative research and qualitative researchers report their findings without having comparison as a requisite feature.

Finally, a limitation may relate to my finding that the vast majority of studies that have been done on doctoral student attrition and persistence employ ex post facto research designs, in which data are collected after the fact -- in this case, after the student has either dropped out or graduated. Ex post facto is also referred to as retrospective research, in that the events have already occurred in the past and can only be studied from the present. Studies conducted after the fact rely on individual's memories for information from the past.

Research Used and the Time Frame of My Study

I selected 1970 as the beginning of the time frame for my study for several reasons, not the least of which are the rather dramatic changes in inquiry that developed from the late 1960s and early 1970s to the present day. During this time period, greater complexity has been introduced into the range of approaches used in educational research in general, and methods not readily available before began to come into greater use in investigations of doctoral student persistence and attrition studies. These developments occurred in large part because of the introduction of microcomputers and software packages and their increasing ease of use. Although not always the case, in more recent years doctoral student persistence and attrition researchers have begun to use multiple, more complex approaches to analysis. For example, regression analysis was seldom used to study doctoral student persistence and attrition prior to 1970; by the 1980s and 1990s I found many examples of studies where regression procedures were used to state mathematical relationships between sets of predictor variables and criterion variables in multiple correlations. Even more recently, path analysis has been used in doctoral student persistence and attrition research to build upon correlation coefficients in order to develop inferences about "causal" relationships among variables. Multiple or mixed statistical approaches are being used increasingly as they render the studies much more complex than those where a more singular approach is used. Several researchers whose works were used in my study

intentionally mixed qualitative and quantitative research approaches in order to seek more complex results than might be obtained with a single approach.

Types of Research

Five different types of research studies were represented in the literature on doctoral student attrition and persistence selected for this meta-synthesis: quantitative descriptive research, correlational research, criterion group research, experimental/quasi-experimental research, and qualitative research, (Vockell & Asher, 1995). These general types of research are not mutually exclusive.

Quantitative descriptive research studies are abundant in the literature on doctoral student attrition and persistence. This may be because they not only add important information to the body of research on the phenomenon, but they also are used by institutional researchers for purposes of reporting, planning, decision making, and policy analysis. In descriptive studies, the researchers use surveys, institutional data, or other information collected to measure and describe characteristics of groupings of individuals -- usually, in this case, those who completed the doctoral degree, dropped out of doctoral study, and/or remain in ABD status.

Correlational research, a form of descriptive research, is also abundant in the literature on doctoral student attrition/persistence. These studies are primarily designed to examine the quantitative relationships between/among two or more variables. While correlational research is useful in determining relationships among variables, it does not make generalizations about the causal nature of these relationships. Additional statistical techniques are applied to make inferences about causality, such as in path analysis.

Criterion group research is useful when studying persistence and attrition, insofar as it examines characteristics of groups that already exist (as opposed to experimental and control groups which are intentionally formed by the researcher) and determines the extent to which these groups differ. Not surprisingly, those most often studied in persistence/attrition research are the degree completion or graduate group, the ABD group, and the attrition group. The researcher looks for ways in which the groups differ with regard to specified outcome variables. It is

important to note that causation is also not established through this form of non-experimental research.

I located only one study in the literature in which an experimental research design was used. In that study, participants were assigned to the treatment group and the control groups in an attempt to determine whether the treatment program (i.e., lecture/discussions on time management, action plans, work style, motivation, self reinforcement, cognitive restructuring, and brainstorming, and a weekly work progress sheet) had an effect on the outcome variable -- dissertation completion. However, because the treatment program was multi-modal, it was not possible for the researcher to establish the effectiveness of the individual treatment components or to identify any true causation.

In recent years, several qualitative research studies have been completed on doctoral student attrition and persistence. Qualitative approaches (most often case studies or ethnographies) are used to obtain information from a sample of individuals of one group (for example, successful degree completers) or from samples of individuals from more than one group (such as persisters and non-persisters). This information is analyzed with a focus on identifying larger themes that help to provide in-depth understandings of a phenomenon -- in this case, usually the reasons why students leave doctoral study, or the factors that contribute to doctoral student persistence.

Summary

In this paper I have described meta-synthesis, an approach to research synthesis that has some commonalities with (and some differences from) both meta-analysis and meta-ethnography. It is intended for use by researchers who seek a qualitative synthesis approach for use with multiple qualitative and quantitative studies on a specific topic of interest contained within the research literature. Relying on evaluation and synthesis, this approach can provide new information, understandings, interpretations, and meanings. Such information may be useful for faculty who teach, conduct research, provide service, or help formulate higher education policies

and practices. The understandings gleaned through this research may also be of interest to doctoral students and academic administrators.

I have presented the need for this method of research synthesis because it addresses an emergent question of interest in research methodology. Both meta-analysis and meta-ethnography have been presented by other authors to fill important niches in research methodology, and I contend that meta-synthesis makes a related contribution to research methodology because it addresses a research problem not addressed by meta-analysis or meta-synthesis. Through this approach, I believe greater understanding can be achieved through the systematic analysis of research literature on any given topic.

I invite your discussion of and reactions to this paper. You may contact me at:

Carolyn Richert Bair, Ph.D.
Assistant Professor
University of Northern Iowa
Educational Leadership, Counseling, and Postsecondary Education
524 Schindler Education Center
Cedar Falls, IA 50614-0604

319-273-2636 (Office)
319-273-5175 (FAX)

Carolyn.Bair@uni.edu

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