Doctoral Students' Reasons for Reading Empirical Research Articles: A Mixed Analysis

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Abstract

Little is known about reading ability among doctoral students. Thus, we used a fully mixed concurrent equal status design (Leech & Onwuegbuzie, 2009) to examine 205 doctoral students in the College of Education and their reasons for reading research articles. A thematic analysis revealed 5 themes (subsumed by 2 meta-themes) explaining reasons for reading. A series of canonical correlation analyses revealed statistically significant multivariate relationships between reasons for reading empirical articles and (a) reading intensity (i.e., frequency of reading empirical research articles, number of empirical research articles read each month) and (b) reading ability (i.e., reading comprehension, reading vocabulary). The implications of these and other findings are discussed.

Keywords: Reading, Literacy, Higher Education, Mixed Methods Research, Mixed Research, Adult Learning, Doctoral Students.

Doctoral candidates are not only enrolled students, they also have multiple life roles and responsibilities, as well as diverse life experiences. For example, in addition to the roles and responsibilities as scholars, many doctoral students also have full- or part-time jobs, graduate assistantships, families for which to care, and other varied personal roles and responsibilities that contribute toward the complexity and motivations for attaining a doctoral degree. In addition to having varied educational, professional, and personal foci, doctoral students are diverse culturally, physically, and socioeconomically. Doctoral students in the college of education, in particular, tend to be nearly 10 years older (average age 42) and also take an average of nearly 5 years longer to complete their degrees than do doctoral students in other disciplines (Smallwood, 2006). Specifically, many are in their thirties to mid-forties in age, and return to school during and/or after employment in the workforce toward increasing their knowledge in their respective professions (Evans, 2002; Evans & Pearson, 1999; Neumann, 2003; Pearson & Ford, 1997; Usher, 2002). They typically do not perceive themselves as preparing for the workforce - as under-

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graduates do; however, they view themselves as being active participants in research and other areas of employment related to their research (Pearson, Evans, & Macauley, 2004).

Overall, studies of doctoral students seem to have a relatively small representation in the academic literature (Benge, Onwuegbuzie, Mallette, & Burgess, 2010). The dearth of research includes examination of doctoral student attrition rates (Golde, 2005; McAlpine & Norton, 2006), graduation rates (Bowen & Rudenstine, 1992; Cesari, 1990), and mentorship (Grady & Hoffman, 2007). Until recently, one under-explored area regarding doctoral students that might positively contribute toward research addressing attrition rates, graduation rates, and mentorship is in the area of reading. The lack of research in this area could be explained by the assumption that doctoral students should have little or no difficulty in reading what is required for their classes and/or individual research. However, to date, scant research has been conducted that specifically explores doctoral students' reading abilities or personal motivations or barriers in any academic programs as they pertain to reading empirical literature.

McMinn, Tabor, Trihub, Taylor, and Dominguez (2009) surveyed 744 doctoral students in the field of clinical psychology to explore their reading habits as well as motivating and hindering factors for completing assigned readings. They reported that approximately only 50% of the 744 respondents indicated that they thoroughly read the assigned readings for their classes. Using a Likert-format scale, the factors that received the highest rating in motivation to read were: (a) interest in the topic, (b) writing assignments based on the reading, and (c) quizzes or tests over the material. In contrast, the factors that inhibited reading were (a) demands from other classes relative to the length of the reading assignment and (b) other life obligations.

Interestingly, utilizing open-ended response questions, Benge et al. (2010) derived similar hindering factors in their investigation of the perceived barriers to reading empirical literature reported by doctoral students in the field of education. Benge et al. (2010) identified eight themes: (a) time, (b) research/statistics knowledge, (c) interest/relevance, (d) prior knowledge, (e) vocabulary, (f) reader attributes, (g) text coherence, and (h) volume of reading. Responses included within the theme of time were other responsibilities such as family and career.

However, aside from McMinn et al. (2009), whose study focused on assigned readings, no researcher has yet explored specifically the reasons *why* doctoral students engage in reading empirical literature—either assigned or self-selected. Moreover, being mindful of its potential to lead to the understanding of complex phenomena, what is lacking from studies conducted at the doctoral level are mixed research studies that involve "mix[ing] or combin[ing] quantitative and qualitative research techniques, methods, approaches, concepts or language into a single study" (Johnson & Onwuegbuzie, 2004, p. 17). Thus, what is needed are studies examining doctoral students' perceptions of why they read empirical research articles in general, and mixed research studies in particular. This was the goal of the current study.

Therefore, toward coming closer to addressing and answering these questions, the following sections in this study are: (a) adult learning theory as the theoretical framework to support the study; (b) the methodological framework used to elicit and analyze the data; (c) the results of the analyses; (d) the conclusion of the findings; and (e) suggestions for future research.

Theoretical Framework

As adult learners, doctoral students approach a new learning experience with a distinct set of assumptions that identify the primary purposes of adult learning (Knowles, Holton, & Swanson, 2005). Historically, Knowles (1968) proposed a theory of adult learning (i.e., andragogy) that characterized adult learners as: (a) autonomous and self-directed in their learning, (b) having many and varied experiences - providing a rich foundation for learning, (c) appreciating the connection between learning to gain knowledge and learning for application, (d) pragmatic (e.g., having a *need to know*, paralleled by a deliberate reason for learning), and (e) intrinsically motivated as they have solid tendencies toward what and how they want to learn.

Although Knowles is a pioneer in the field and a champion of adult learning, his work has received a fair amount of criticism. As Merriam, Caffarella, and Baumgartner (2006) noted, one major contention is that andragogy is not actually a theory but rather a set of assumptions about adult learning. Further, and even more problematic, these assumptions seem devoid of context. That is, Knowles' characterization of learners as autonomous fails to consider, "the product of the sociohistorical and cultural contexts of the times; nor is there any awareness that social institutions and structures may be defining the transaction irrespective of the individual participant" (Merriam et al., 2006, p. 88). Thus, although doctoral students value research activity toward informing their own research and/or professional practices (Barnacle, 2004), this may not be the focus of the institution.

It is also important to recognize that adult learners are not a single, homogenous group, and that perhaps these assumptions of adult learners are more of end goals than shared qualities (see e.g., Baumgartner, Lee, Birden, & Flowers, 2003; Merriam et al., 2006). This idea is further elucidated when exploring models of self-directed learning. In particular, Grow (1991) presents a four-stage model of self-directed learning. The stages represent a continuum from dependent, to interested, to involved, to self-dependent. Interestingly, Grow suggests that these stages are based on several assumptions, which include the idea that self-direction can be situational: a person can be self-directed in one area and not another. In addition, Grow further posits that universities tend to foster dependence rather than promote self-direction.

In this study, the importance of context in adult learning along with the notion that adult learners are differentially self-directed is situated in Giddens' (1984) theory of structuration. Structuration is represented as a duality involving structure and agency. That is, structure and agency are not conceived as two separate entities, but rather as interdependent constructs that produce and reproduce society. Giddens (1984) explains structure as,

"Rules and resources, or sets of transformation relations, organized as properties of social systems" (p. 25). Agency "concerns events of which an individual is the perpetrator, in the sense that the individual could, at any phase in a given sequence of conduct, have acted differently. Whatever happened would not have happened if that individual had not intervened" (Giddens, 1984, p. 9). Thus, one way to understand better the reasons doctoral students read empirical articles is to consider the duality of their agency and structure as adult learners within a doctoral program.

At some point during the doctoral program, a doctoral student will be required to read empirical research articles to formulate an understanding of the organization and technical language of an empirical research study. Presumably, doctoral students have a variety of reasons why they read empirical research articles. Further, the assumptions and goals of adult learning contextualized in Giddens' (1984) theory of structuration provide a framework in which to situate these reasons, which ultimately can inform doctoral students' education.

Methodological Framework

Collins, Onwuegbuzie, and Sutton (2006) conceptualized that mixed research involves the following 13 methodological steps that are grouped within three stages: the *Formulation Stage*: (a) determining the mixed goal of the study (including the underlying philosophical stance), (b) formulating the mixed research objective(s), (c) determining the rationale of the study and the rationale(s) for mixing quantitative and qualitative approaches, (d) determining the purpose of the study and the purpose(s) for mixing quantitative and qualitative approaches, (e) determining the mixed research question(s); the *Planning Stage*: (f) selecting the mixed sampling design, (g) selecting the mixed research design; and the *Implementation Stage*: (h) collecting quantitative and/or qualitative data, (i) analyzing the quantitative and/or qualitative data using quantitative and/or qualitative analysis techniques, (j) validating/legitimating the mixed research findings, (k) interpreting the mixed research findings, (l) writing the mixed research report, and (m) reformulating the mixed research question(s). These 13 steps are continuous, iterative, interactive, and dynamic. According to Leech, Collins, Jiao, and Onwuegbuzie (2010), "Using these interactive steps to formulate, plan, and implement a mixed research study informs the researchers' decisions relative to drawing quality meta-inferences (integration of inferences derived from the quantitative and qualitative study components)…and formulating appropriate generalizations" (p. 5). As recommended by Leech, Onwuegbuzie, and Combs (2011), and as did Benge et al. (2010) in their study of students' perceptions of barriers to reading empirical literature, the current study was structured in accordance to each of these 13 interactive steps.

Step 1: Mixed goal. Using Newman, Ridenour, Newman, and DeMarco's (2003) nine-element typology, the goal of the present mixed research study was to have a personal, institutional, and/or organizational impact on future doctoral programs. The research paradigm that drove this investigation is what Johnson (2011) recently has labeled as *dialectical pluralism*, whereby the researcher incorporates multiple epistemological perspectives within the same inquiry. Specifically, in the present study, the following two epis-

temological perspectives were combined: pragmatism-of-the-middle and transformative-emancipatory. According to Onwuegbuzie, Johnson, and Collins (2009), pragmatism-of-the-middle "offers a practical and outcome-oriented method of inquiry that is based on action and leads, iteratively, to further action and the elimination of doubt; paradigms routinely are mixed" (p. 134). In contrast, the transformative-emancipatory paradigm is driven by the researcher, whose goal is to conduct research that is emancipatory, participatory, and antidiscriminatory, and which focuses directly on the lives and experiences of underserved and marginalized persons or groups such as women; ethnic/racial/cultural minorities; certain religious groups, individuals with disabilities/exceptionalities; and members of gay, lesbian, bisexual, and transsexual communities (Mertens, 2003). In this study, in the context of literacy, doctoral students who were struggling readers were treated as an underserved group because of the scant attention they have received in the literature.

Step 2: Mixed research objective. The objectives of this mixed research study were fourfold: (a) exploration, (b) description, (c) explanation, and (d) prediction (Johnson & Christensen, 2010). Specifically, the objectives of the quantitative phase were description and prediction. The objectives of the qualitative phase were exploration and description. Finally, all four objectives were pertinent in the mixed research phase.

Step 3: Rationale for mixing. Using Collins et al.'s (2006) rationale and purpose (RAP) model, the rationale for conducting the mixed research study could be classified as (a) participant enrichment, (b) instrument fidelity, and (c) significance enhancement. *Participant enrichment* refers to the mixing of quantitative and qualitative approaches for the rationale of optimizing the sample (e.g., increasing the number of participants, enhancing the likelihood of securing complete and valid responses). *Instrument fidelity* represents the procedures used by the researcher(s) to maximize the utility and/or appropriateness of the instruments used in the investigation, whether qualitative or quantitative. *Significance enhancement* refers to mixing qualitative and quantitative techniques to maximize the interpretations of data (i.e., quantitative data/analysis being used to enhance qualitative analyses and/or qualitative data/analysis being used to enhance statistical analyses). With respect to participant enrichment, prior to the study, the participants were informed about the importance of completing all instruments as comprehensively and as accurately as possible. Also, the students were informed that the ensuing dataset would be used by the instructor as a teaching tool to demonstrate to students how to conduct an array of mixed analysis techniques. The goal here was to motivate students to take ownership of the data they and their classmates were providing. With regard to instrument fidelity, the researchers (a) collected qualitative data (e.g., respondents' perceptions of the questionnaire) and quantitative data (e.g., response rate information, missing data information) before the study began (i.e., pilot phase) and (b) used member checking techniques to assess the appropriateness of the questionnaire and the adequacy of the time allotted to complete it, after the major data collection phases. Finally, with respect to significance enhancement, the researchers collected a combination of qualitative and quantitative data to obtain richer data both during and after the study than otherwise would have been obtained using only one type of data (e.g., qualitative), thereby enhancing the significance of their findings (Onwuegbuzie & Leech, 2004).

Step 4: Purpose for mixing. Using the framework of Greene, Caracelli, and Graham (1989), the two purposes for mixing qualitative and quantitative approaches were (a) complementarity (i.e., using quantitative and qualitative techniques to measure multiple aspects of a phenomenon resulting in richer and more elaborate data) and (b) expansion (i.e., increasing the breadth of the study by using different methods to assess different components of the inquiry). Figure 1 provides a visual representation of how the RAP model was utilized in the current inquiry. The purposes of this study were fourfold: (a) to identify doctoral students' reasons for reading research articles, (b) to examine the relationships between these reasons for reading empirical research articles and the actual time
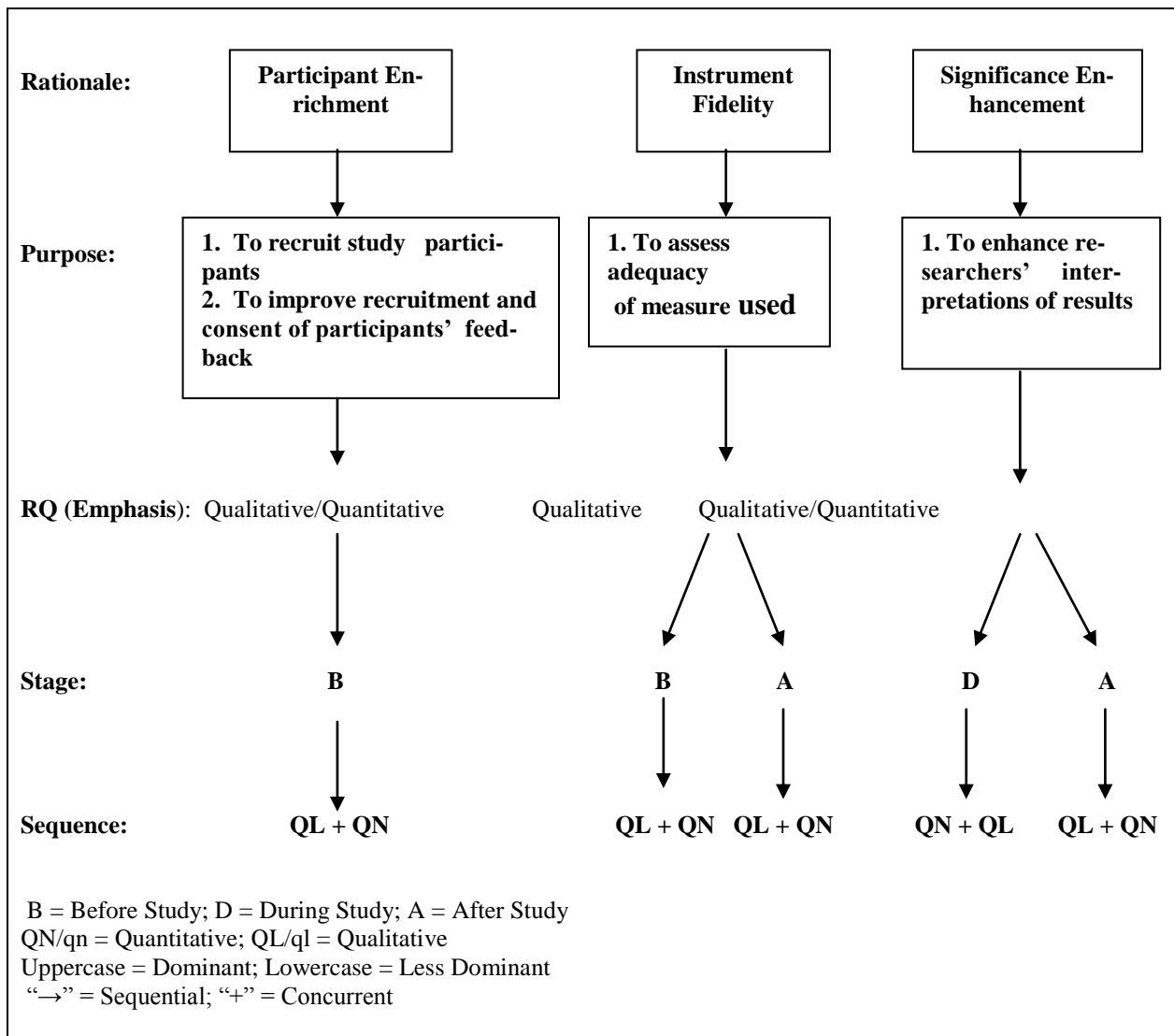
Rationale:	**Participant Enrichment**		**Instrument Fidelity**		**Significance Enhancement**	
Purpose:	1. To recruit study participants 2. To improve recruitment and consent of participants' feedback		1. To assess adequacy of measure **used**		1. To enhance researchers' interpretations of results	
RQ (**Emphasis**):	Qualitative/Quantitative		Qualitative	Qualitative/Quantitative		
Stage:	B		B	A	D	A
Sequence:	QL + QN		QL + QN	QL + QN	QN + QL	QL + QN

 B = Before Study; D = During Study; A = After Study
QN/qn = Quantitative; QL/ql = Qualitative
Uppercase = Dominant; Lowercase = Less Dominant
"→" = Sequential; "+" = Concurrent

Figure 1. Visual representation of RAP model. Adapted from "A model incorporating the rationale and purpose for conducting mixed methods research in special education and beyond" by K. M. T. Collins, A. J. Onwuegbuzie, and I. L. Sutton, 2006, *Learning Disabilities: A Contemporary Journal*, *4*, p. 90. Copyright 2006 by Learning Disabilities Worldwide.

spent reading empirical research articles, (c) to examine the relationships between the reasons for reading empirical research articles and how many empirical research articles doctoral students read in 1 month, and (d) to examine the relationship between reading ability (i.e., reading comprehension, reading vocabulary) and reasons why doctoral students read empirical research articles.

Step 5: Research Questions. In this study, quantitative research questions, qualitative research questions, and mixed research questions were addressed.

Quantitative research questions. For the quantitative phase of this study, the following research questions were addressed:

1. Outside of class, how often do doctoral students read empirical research articles?
2. How many empirical research articles do doctoral students read each month?

Qualitative research question. For the qualitative phase of this study, the following research question was addressed:

3. What reasons do doctoral students provide for reading empirical research articles?

Mixed research questions. The following mixed research questions were addressed:

4. What is the prevalence of each of the reasons for reading empirical articles of doctoral students?
5. How do these perceived reasons for reading empirical articles relate to one another?
6. What is the relationship between reading intensity (i.e., frequency of reading empirical research articles, number of empirical research articles read each month) and doctoral students' reasons they provide for reading empirical research articles?
7. What is the relationship between reading ability (i.e., reading comprehension, reading vocabulary) and the reasons that doctoral students provide for reading empirical research articles?

It was hoped that the results of the present inquiry would contribute to the literature on literacy among adult learners in general and the almost non-existent literature on literacy among doctoral students in particular.

Method

Participants and Setting

Participants were 205 doctoral students enrolled in either a mixed research design or an advanced qualitative research design course housed in the College of Education at a large Tier 1 research university in the southern United States. At the time the study took place,

the sample size represented 35.47% of the doctoral students in the College of Education and 9.21% of the total doctoral student body at the university where the study took place. These students were enrolled in 32 doctoral degree programs within the institution's College of Education. The majority of participants was female (*n* = 121, 59.2%) and White (*n* = 130, 63.4%). The remaining ethnicity distribution was American Indian or Alaskan Native (*n* = 30, 14.6%), Hispanic (*n* = 18, 8.8%), African American (*n* = 14, 6.8%), and Asian (*n* = 10, 4.9%). Most of participants were native English speakers (*n* = 178, 86.8%). The age range of the participants was 22 to 56 years (*M* = 40.88, *SD* = 9.81). Finally, with respect to academic achievement, the mean grade point average (GPA) of the participants was 3.80 (*SD* = 0.21).

Step 6: Mixed sampling scheme. All 205 participants contributed data both to the qualitative and quantitative phases of the investigation and were collected concurrently. As such, the mixed sampling design represented a concurrent design using identical samples (Onwuegbuzie & Collins, 2007).

Research Design

Step 7: Mixed research design. The initial qualitative and quantitative data were collected and analyzed concurrently and both the qualitative and quantitative phases were given approximately equal priority; therefore, this study was classified as a fully mixed concurrent equal status design (Leech & Onwuegbuzie, 2009).

Instruments and Procedures

Step 8: Mixed data collection. In the first class session, all participants were administered the following two instruments: the Nelson-Denny Reading Test (NDRT) and the Reading Interest Survey (RIS). The NDRT, developed by Brown, Fishco, and Hanna (1993), was used to measure reading ability. This instrument, which is appropriate for Grades 9 to 16, college students, and adults, is a 118-item test containing two subtests: Vocabulary (80 items) and Comprehension (38 items). Each item on the NDRT contains a five-choice response option. This test was selected because of its widespread use among researchers, adequate score reliability, and score validity that have been reported in the literature, as well as the fact that normative data are available on very large samples of high school and college students (Brown et al., 1993). For the present investigation, both the reading vocabulary scores and reading comprehension scores were analyzed. Score reliability (i.e., KR-20) was .85 (95% confidence interval [CI] = .82, .88) for the reading vocabulary subtest and .69 (95% CI = .63, .75) for the comprehension subtest. The RIS contains 62 open- and closed-ended items; therefore, the mixed data collection style used in the present study could be referred to as Type 2 data (Johnson & Turner, 2003).

Data Analysis

The mixed analysis framework represented a sequential mixed analysis (SMA; Onwuegbuzie & Teddlie, 2003; Tashakkori & Teddlie, 1998). In this SMA framework, both qualitative and quantitative data analyses occurred in a sequential and iterative manner, be-

ginning with quantitative analyses, followed by qualitative analyses that built upon the quantitative analyses, followed by quantitative analyses of the qualitative data. This iterative analysis sequence involved abductive reasoning whereby inductive reasoning and deductive reasoning interacted with each other throughout the analysis process (Morgan, 2007). Further, the goal of the SMA was typology development (Caracelli & Greene, 1993). The SMA involved six stages. Each stage is described below.

Stage 1. The first stage involved the use of descriptive statistics (i.e., descriptive stage) to determine how often doctoral students read empirical research articles outside of class (Research Question 1) and how many empirical research articles doctoral students read each month (Research Question 2).

Stage 2. In the second stage, the doctoral students' reasons for reading empirical research articles were thematically analyzed (i.e., exploratory stage; Research Question 3). The goal of the thematic analysis was to understand the phenomenon of doctoral students' reasons for reading empirical articles (Goetz & LeCompte, 1984). The thematic analysis was constructive, inductive, and generative because it necessitated the researchers *bracketing* or suspending all preconceptions or judgments to the greatest extent possible (i.e., *epoche*) in an attempt to minimize bias (Moustakas, 1994). Clusters of themes were extracted via constant comparison analysis (Glaser & Strauss, 1967), which then were compared to the original descriptions for the purpose of verifying the clusters (Leech & Onwuegbuzie, 2007). This was undertaken a posteriori (Constas, 1992) in order to ensure that no original statements made by the doctoral students were unaccounted for by the cluster of themes and that no cluster contained units that were not original statements. This five-step method of thematic analysis was used to identify themes pertaining to students' reasons for reading empirical research articles (i.e., reason themes). Using Constas' (1992) framework, the locus of typology development was *investigative*, stemming from the cognitive constructions of the researchers, as was the source for naming of categories. Peer debriefing (Lincoln & Guba, 1985) also was used to legitimize the data interpretations. In particular, the remaining researcher served as a peer debriefer, whose goal was to examine the audit trail (Lincoln & Guba, 1985) to assess whether all interpretations stemmed directly from the data. This Stage 2 analysis continued until the researchers reached 100% agreement on the themes.

Stage 3. The third stage of the SMA involved the use of descriptive statistics (i.e., exploratory stage) to analyze the hierarchical structure of the emergent reason themes (Onwuegbuzie & Teddlie, 2003). Specifically, each theme was *quantitized* (Tashakkori & Teddlie, 1998) such that if a doctoral student listed a reason that was eventually unitized under a particular reason theme, then a score of "1" was given to the reason theme for the student response; a score of "0" was given otherwise. This dichotomization led to the formation of an *inter-respondent matrix* of reason themes (i.e., *student x theme matrix*) (Onwuegbuzie, 2003a; Onwuegbuzie & Teddlie, 2003), which consisted only of 0s and 1s. By calculating the frequency of each reason theme from the inter-respondent matrix, percentages were computed to determine the prevalence rate of each reason theme (Research Question 4). These frequencies served as effect sizes (Onwuegbuzie & Teddlie, 2003).

Stage 4. In the fourth stage of the SMA, the inter-respondent matrix of reason themes, which was extracted in Stage 3, was used to conduct a principal component analysis to ascertain the underlying structure of the emergent reason themes (i.e., exploratory stage; Research Question 5). Specifically, the inter-respondent matrix was transformed to a matrix of bivariate associations that represented tetrachoric correlation coefficients because the reason themes had been quantitized to dichotomous data (i.e., "0" vs. "1"), and tetrachoric correlation coefficients are appropriate to use when one is determining the relationship between two (artificial) dichotomous variables (cf. Onwuegbuzie et al., 2007). Thus, the matrix of tetrachoric correlation coefficients was the basis of the principal component analysis, which led to the determination of the number of factors underlying the reason themes (Onwuegbuzie et al., 2007). An orthogonal (i.e., varimax) rotation was employed, using the eigenvalue-greater-than-one rule (i.e., K1; Kaiser, 1958), coupled with the *scree* test, to determine an appropriate number of factors to retain (Kieffer, 1999). These factors represented *meta-themes* (Onwuegbuzie, 2003a) such that each meta-theme contained one or more of the emergent reason themes. As recommended by Onwuegbuzie (2003a), the *trace*, or proportion of variance explained by each factor after rotation, served as an effect size index for each meta-theme. By determining the hierarchical relationship among the reason themes (Research Question 5), the verification component of categorization was empirical, technical, and rational (Constas, 1992). The meta-themes extracted via the principal components analysis themselves were quantitized to dichotomous data (i.e., "0" vs. "1"), yielding an inter-respondent matrix of meta-themes.

Stage 5. In the fifth stage, a latent class analysis was used to determine the number of clusters (i.e., latent classes) underlying the reason themes. The assumption behind latent class analysis was that a certain number of distinct reason themes prevailed, and that these reasons can be factored into a small number of unique clusters known as latent classes based on their profiles of reason errors, with each doctoral student belonging to only one cluster.

Stage 6. The sixth and final stage of the SMA (i.e., confirmatory analyses) involved the correlation between the reason themes that were extracted in Stage 2 and quantitized in Stage 3 via the inter-respondent matrix and the following variables: (a) reading intensity (i.e., frequency of reading empirical research articles, number of empirical research articles read each month) (Research Question 6), and (b) reading ability (i.e., reading comprehension, reading vocabulary) (Research Question 7). In this stage, the frequency of reading empirical research articles variable was dichotomized into doctoral students who read empirical research articles at least once per week and those who read empirical research articles less than once per week. For both Research Question 6 and Research Question 7, a canonical correlation analysis (Cliff & Krus, 1976; Darlington, Weinberg, & Walberg, 1973; Thompson, 1980, 1984) was used to examine the multivariate relationship between the reason themes and the two sets of reading variables (i.e., reading intensity and reading ability). For each statistically significant canonical coefficient, standardized coefficients and structure coefficients were computed. These coefficients served as *inferential-based effect sizes* (Onwuegbuzie, 2003a). Similarly, a canonical correlation analysis was conducted to examine the multivariate relationship between the meta-themes

extracted in Stage 4 and the two sets of reading variables (i.e., reading intensity and reading ability).

Step 9: Results

Stage 1 Findings

With respect to how frequently the doctoral students read empirical research articles outside of class, 7.7% reported that they never read empirical research articles, with a further 10.3% stating that they read empirical research articles approximately once per year. The remaining distribution was as follows: approximately once per month (45.6%), approximately once per week (29.2%), almost daily (6.7%), and daily (0.5%). In addition, the number of empirical research articles that the doctoral students reported reading each month ranged from 0.5 to 50.00 ($M = 9.86$, $SD = 10.16$).

Stage 2 and Stage 3 Findings

The constant comparison analysis revealed the following five emergent themes that represented doctoral students' reasons for reading empirical research articles: requirement, guidance, gain knowledge, stay current, and interest/curiosity. Table 1 presents these five themes, together with their corresponding sample significant statements and formulated meanings.

The three researchers who conducted the constant comparison analysis agreed on all five emergent themes (i.e., 100% inter-coder agreement). In fact, the only discrepancies stemmed from the labels given to some of the themes. As a result of these discrepancies, the researchers scheduled meetings to agree on more appropriate labels for the themes. This led to the re-labeling of some of the themes that were maximally meaningful.

The prevalence rate (i.e., effect size) of each theme (Onwuegbuzie, 2003a; Onwuegbuzie & Teddlie, 2003) also is presented in Table 1. Interestingly, requirement and guidance were equally the most endorsed theme, with slightly more than one third of the participants (i.e., 34.1%) providing responses that were given these classifications. The requirement and guidance themes were followed closely by the gain knowledge theme, with an endorsement rate slightly less than one third. The last two themes were stay current and interest/curiosity, which fell between 25.4% and 28.8%. As conducted by Benge et al. (2010), using Cohen's [1988, pp. 180-183] non-linear arcsine transformation and Cohen's (1988) *d* criteria led to cut-points of 1% endorsement as representing a small effect size, 7% endorsement as representing a medium effect size, and 16% endorsement as representing a large effect size. Thus, all five themes represented a large effect size.

Stage 4 Findings

A principal component analysis was used to determine the number of factors underlying the five themes. This analysis was conducted because it was expected that many/most of

Table 1. Themes, Frequencies, Formulated Meanings and Selected Examples of Statements of Doctoral Students' Reasons for Reading Empirical Articles.

Theme	Frequency %	Formulated Meaning	*Sample Significant Statements*
Requirement	34.1	External necessity usually related to course assignment, dissertation research, or job	*Because they are assigned* *To fulfill course requirements* *Required for class*
Guidance	34.1	Using empirical research as a guide, model, or exemplar for one's practice or for one's research, or as a source for ideas for current and future research	*To help with my coursework* *As examples for my own work* *To improve my own teaching*
Gain Knowledge	31.7	Learning about or gaining new knowledge or understanding about various topics or research methods	*To improve my personal knowledge* *To gain knowledge about interesting subjects* *Because I can learn from them*
Stay Current	28.8	Stay current with the latest research in one's practice or field of interest	*To stay current in field* *To keep up to date*
Interest/ Curiosity	25.4	Interest or curiosity about the topic and perception that the reading is important to the respondents' field of study	*They are of interest to me* *The topic is something I am curious about* *Professional interest*

the themes would be significantly correlated. As recommended by Kieffer (1999) and Onwuegbuzie and Daniel (2003), the correlation matrix was used to undertake the analysis. An orthogonal (i.e., varimax) rotation was employed. This analysis was used to extract the latent constructs. As conceptualized by Onwuegbuzie (2003a), these factors represented *meta-themes*.

The eigenvalue-greater-than-one rule (i.e., K1; Kaiser, 1958) resulted in two factors (i.e., meta-themes) being retained. The *scree* test, which represents a plot of eigenvalues against the factors in descending order (Cattell, 1966; Zwick & Velicer, 1986), also suggested that two factors be retained. This two-factor solution is presented in Table 2. Using a cutoff correlation of 0.3, recommended by Lambert and Durand (1975) as an acceptable minimum value for pattern/structure coefficients, Table 2 reveals that the following themes had pattern/structure coefficients with large effect sizes on the first factor: guidance, requirement, and stay current; and the following themes had pattern/structure coefficients with large effect sizes on the second factor: gain knowledge and interest/curiosity. It should be noted that in addition to having a pattern/structure coefficient with a large effect size on Factor 1, both guidance and requirement had significant but smaller pattern/structure coefficients on Factor 2 (i.e., cross-loadings).

The first meta-theme (i.e., Factor 1) was labeled *professional*. The second meta-theme (i.e., Factor 2) was termed *personal*. Interestingly, within the *professional* meta-theme (i.e., Factor 1), requirement was negatively related to both guidance and stay current, indicating that doctoral students who were more likely to cite requirement as a reason for

Table 2. Stage 4: Summary of Themes and Factor Pattern/Structure Coefficients from Principal Component Analysis (Varimax): Two-Factor Solution.

Theme	Factor Coefficients[1]		
	1	2	Communality Coefficient
Guidance	**.78**	**.30**	.70
Requirement	**-.64**	**.39**	.56
Stay Current	**.52**	-.17	.30
Gain Knowledge	.02	**-.85**	.72
Interest/Curiosity	-.08	**.48**	.24
Trace	1.43	1.09	2.52
% variance explained	28.62	21.93	50.55

[1]Coefficients in bold represent pattern/structure coefficients with the largest effect size within each theme using a cut-off value of 0.3 recommended by Lambert and Durand (1975).

Table 3. Stage 4 Analysis: Description of Meta-Themes Emerging from Principal Component Analysis.

Meta-Themes	Themes	Descriptions
Professional	Guidance, Requirement, Stay Current	These factors represent doctoral students' reasons for reading empirical literature that are related to job requirements, occupational goals, and/or their doctoral education
Personal	Gain Knowledge Interest/Curiosity	These factors comprise doctoral students' reasons for reading empirical literature that are related to one's individual goals

reading empirical articles were less likely to cite guidance and stay current as reasons. Similarly, within the personal meta-theme (i.e., Factor 2), gain knowledge and interest/curiosity were negatively related. The descriptions of both meta-themes are presented in Table 3.

An examination of the *trace* (i.e., the proportion of variance explained, or eigenvalue, after rotation; Hetzel, 1996) revealed that the *professional* meta-theme (i.e., Factor 1) explained 28.62% of the total variance and the *personal* meta-theme (i.e., Factor 2) accounted for 21.93% of the variance. These two meta-themes combined explained 50.55% of the total variance. Interestingly, this proportion of total variance explained is greater than that typically explained in factor solutions (Henson, Capraro, & Capraro, 2004;
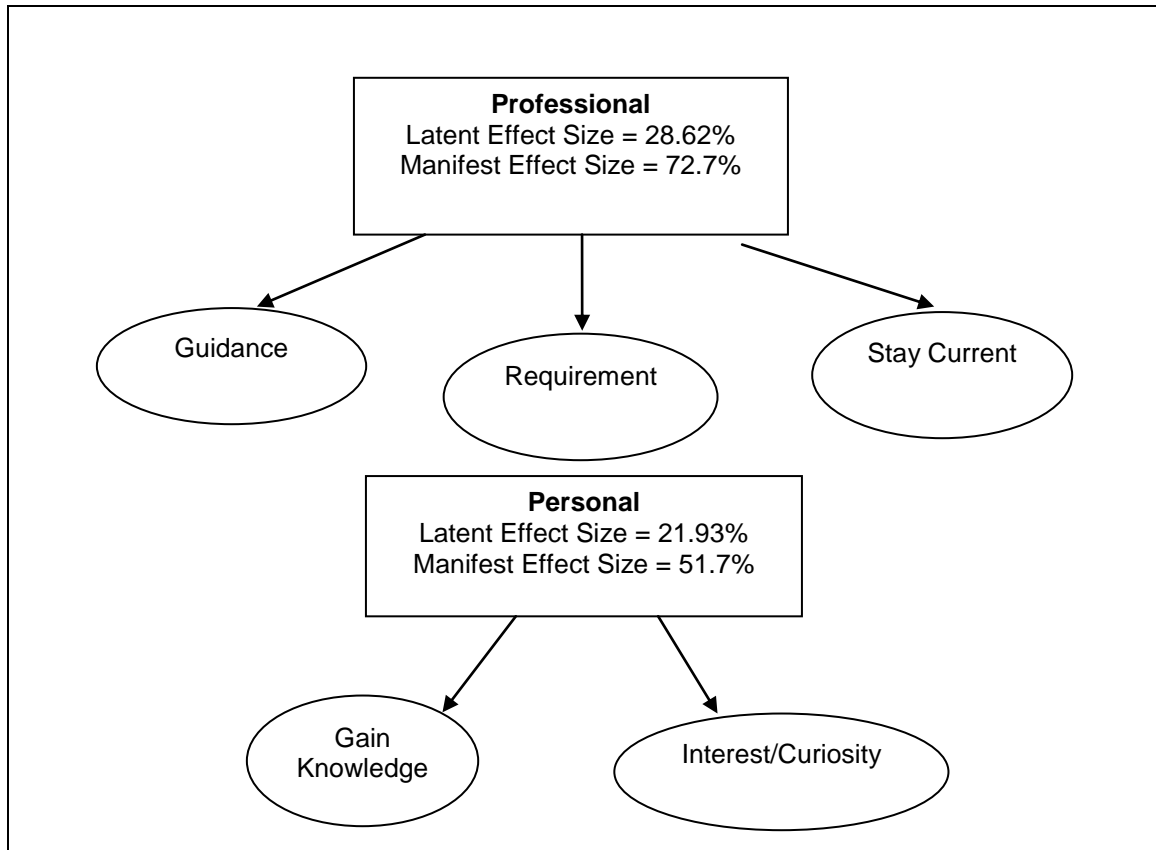
Figure 2. Stage 4: Thematic structure pertaining to doctoral students' reasons for reading empirical articles.

Henson & Roberts, 2006). As such, this total proportion of variance, which provides a latent effect size index, can be considered large. The manifest effect size (i.e., actual endorsement rate per meta-theme) associated with the two meta-themes was as follows: *professional* (72.7%) and *personal* (51.7%). The thematic structure, including the latent effect sizes and manifest effect sizes, is presented in Figure 2. This figure illustrates the relationships among the themes and meta-themes arising from doctoral students' reasons for reading empirical articles.

Stage 5 Findings

The latent class analysis of the five reason themes suggested that the optimal number of clusters was three ($L^2 = 21.52$, df = 14, $p = .089$, Bootstrap $p = .20$). Figure 3 displays these three distinct groups of doctoral students. Further, it can be seen from Figure 3 that Cluster 1 (comprising 56.16% of doctoral students) is fluctuating with low to moderate endorsement rates. In contrast, Cluster 2 (comprising 32.17% of doctoral students) has relatively low endorsement rates for all reason themes except for requirement, which is extremely high (i.e., conditional probability = 97.33%). Thus, requirement maximally
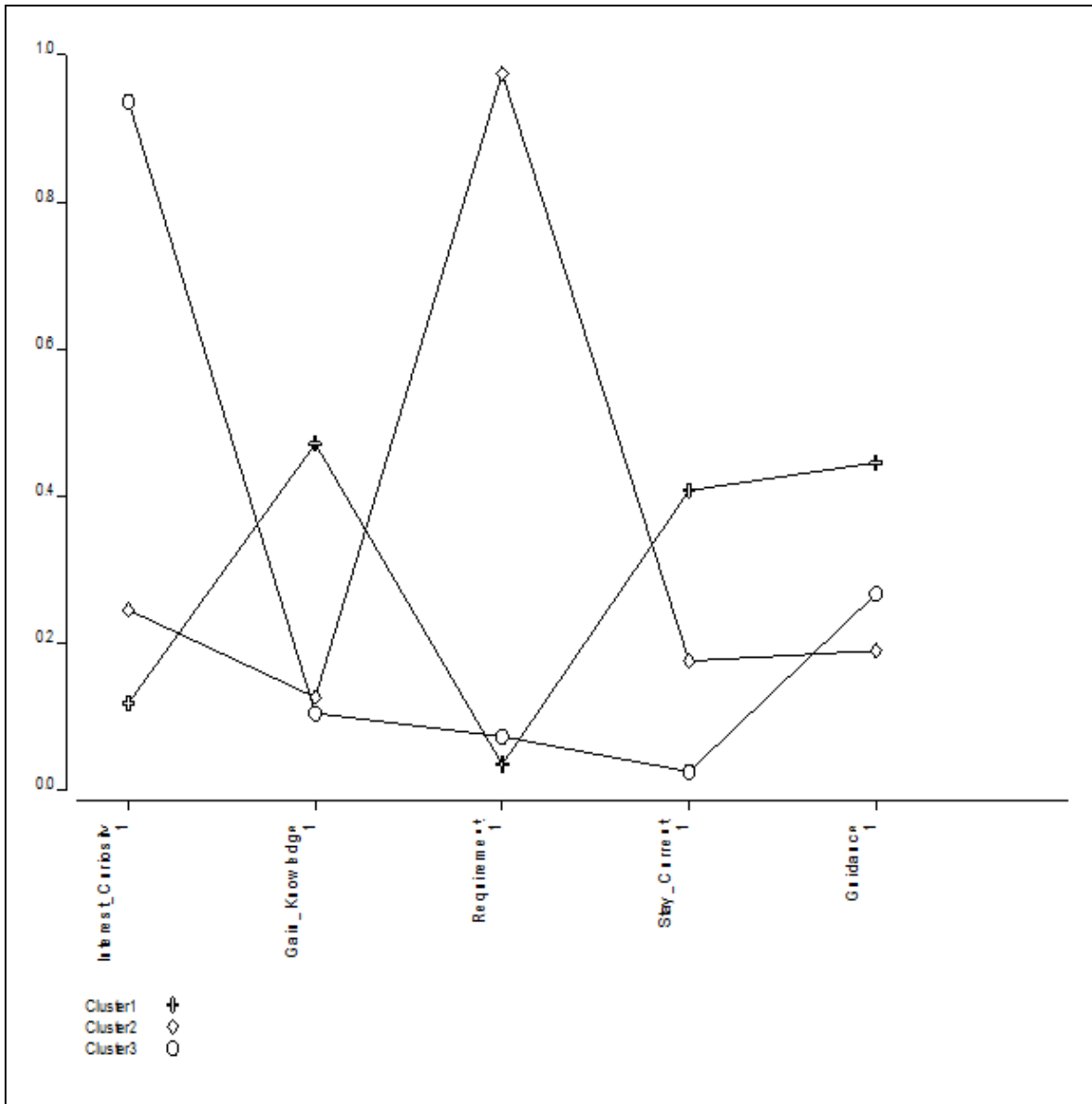
Figure 3. Profiles of doctoral students as a function of the five reason themes.

separates Cluster 2 from the other two clusters. Cluster 3 (comprising 11.67% of doctoral students) also is characterized with relatively low endorsement rates for four of the five reason themes, with a very high endorsement rate for interest/curiosity (i.e., conditional probability = 93.51%). As such, interest/curiosity maximally separates Cluster 3 from the other two clusters. Interestingly, all five reason themes statistically significantly discriminated the three clusters as follows: interest curiosity (Wald = 6.22, p = .045, R^2 = 34.16%), gain knowledge (Wald = 10.77, p = .0046, R^2 = 14.09%), requirement (Wald = 6.10, p = .047, R^2 = 84.29%), stay current (Wald = 7.05, p = .03, R^2 = 9.82%), and guidance (Wald = 8.63, p = .013, R^2 = 6.26%). Examining the R^2 values indicates that guidance had by far the most variance explained by the 3-cluster model, with 84.29% vari-

ance explained. That is, requirement played the biggest role in discriminating the three clusters of doctoral students. Interest/curiosity also played a substantive role, albeit a smaller role than did requirement.

Stage 6 Findings

Relationship between reading reasons and reading intensity. A canonical correlation analysis was undertaken to examine the relationship between the five reason themes and the two reading intensity variables (i.e., frequency of reading empirical research articles, number of empirical research articles read each month). The five reason themes were treated as the dependent set of variables, whereas the two reading intensity variables served as the independent multivariate profile. The number of canonical functions (i.e., factors) that can be generated for a given dataset is equal to the number of variables in the smaller of the two variable sets (Thompson, 1980, 1984, 1988, 1990). Because five themes were correlated with two independent variables, two canonical functions were generated.

The canonical analysis revealed that the two canonical correlations combined were statistically significant ($p < .05$). Also, when the first canonical root was excluded, the remaining root was not statistically significant ($p = .91$; Canonical $R_{c2} = .07$). Together, these results suggested that the first canonical function was statistically significant and practically significant ($p < .05$; Canonical $R_{c1} = .28$) (Cohen, 1988), but the remaining root was not statistically significant.

Data pertaining to the first canonical root are presented in Table 4. This table displays both standardized function coefficients and structure coefficients. Using a cutoff correlation of 0.3 (Lambert & Durand, 1975), the standardized canonical function coefficients revealed that gain knowledge, requirement, and stay current made important contributions to the set of reason themes. With respect to the reading intensity set, both frequency of reading empirical research articles and number of empirical research articles read each month made noteworthy contributions, with frequency of reading empirical research articles making by far the greatest contribution. The structure coefficients pertaining to the first canonical function revealed that interest/curiosity, guidance, requirement, and stay current made important contributions to the first canonical variate, with stay current making by far the greatest contribution. The square of the structure coefficient indicated that stay current explained 65.6% of the variance. With regard to the reading intensity cluster, only frequency of reading empirical research articles made a noteworthy contribution, explaining 90.3% of the variance. Comparing the standardized and structure coefficients identified gain knowledge as a suppressor variable because the standardized coefficient associated with this variable was large, whereas the corresponding structure coefficient was relatively small (Onwuegbuzie & Daniel, 2003). Suppressor variables are variables that assist in the prediction of dependent variables due to their correlation with other independent variables (Tabachnick & Fidell, 2006). Also, number of empirical research articles read each month served as a suppressor variable. Further, interest/curiosity and guidance suggested multicollinearity because the structure coefficient associated with this

Table 4. Stage 5: Canonical Solution for First Function: Relationship Between the Five Reason Themes and the Two Reading Intensity Variables.

Variable	Standardized Coefficient	Structure Coefficient	Structure^2 (%)
Reason Theme:			
Interest/Curiosity	-.26	-.31[*]	9.6
Gain Knowledge	-.31[*]	-.15	2.3
Guidance	.11	.32[*]	10.2
Requirement	-.52[*]	-.60[*]	36.0
Stay Current	.65[*]	.81[*]	65.6
Reading Intensity:			
Frequency of reading empirical research articles	1.06[*]	.95[*]	90.3
Number of empirical research articles read each month	-0.32[*]	.04	0.2

[*]Coefficients with the effect sizes larger than .3 (Lambert & Durand, 1975).

variable was large, whereas the corresponding standardized coefficient was relatively small (Onwuegbuzie & Daniel, 2003). Interestingly, for both the standardized and structure coefficients, guidance and stay current were negatively related to the three other important variables (i.e., interest/curiosity, gain knowledge, and requirement). Also, for the standardized coefficient, frequency of reading empirical research articles and number of empirical research articles read each month were negatively related.

A canonical correlation analysis also was undertaken to examine the relationship between the two reason meta-themes and the two reading intensity variables. The two meta-themes were treated as the dependent set of variables, whereas the two reading intensity variables again were utilized as the independent multivariate profile. The canonical analysis revealed that the two canonical correlations combined were neither statistically significant ($p = .65$) nor practically significant (Canonical $R_{c2} = .10$). Thus, the standardized canonical function coefficients and structure coefficients were not interpreted.

Relationship between reading reasons and reading ability. A canonical correlation analysis was undertaken to examine the relationship between the five reason themes and the two reading ability variables (i.e., reading comprehension, reading vocabulary). The

five reason themes were treated as the dependent set of variables, whereas the two reading ability variables served as the independent multivariate profile. The canonical analysis revealed that the two canonical correlations combined were statistically significant ($p < .05$). However, when the first canonical root was excluded, the remaining root was not statistically significant ($p = .83$; Canonical $R_{c2} = .09$). Together, these results suggested that the first canonical function was statistically significant and practically significant ($p < .05$; Canonical $R_{c1} = .16$) (Cohen, 1988), but the remaining root was not statistically significant.

Table 5. Stage 5: Canonical Solution for First Function: Relationship Between the Five Reason Themes and the Two Reading Ability Variables.

Variable	Standardized Coefficient	Structure Coefficient	Structure^2 (%)
ReasonTheme:			
Interest/Curiosity	-.05	-.18	3.2
Gain Knowledge	.32*	.13	1.7
Guidance	.85*	.75*	56.3
Requirement	.54*	.20	4.0
Stay Current	.46*	.46*	21.2
Reading Ability:			
Reading Vocabulary	-.02	.44*	19.4
Reading Comprehension	1.01*	.99*	98.0

*Coefficients with the effect sizes larger than .3 (Lambert & Durand, 1975).

Data pertaining to the first canonical root are presented in Table 5. The standardized canonical function coefficients revealed that four of the five reason themes, namely, gain knowledge, guidance, requirement, and stay current made important contributions to the set of themes, with guidance making by far the largest contribution. With respect to the reading ability set, only reading comprehension made a noteworthy contribution. The structure coefficients pertaining to the first canonical function revealed that guidance and stay current again made important contributions to the first canonical variate, explaining 56.3% and 21.2% of the variance, respectively. With regard to the reading ability cluster, both reading vocabulary and reading comprehension made noteworthy contributions, with reading comprehension making the strongest contribution, explaining 98.0% of the

variance. Comparing the standardized and structure coefficients identified gain knowledge and requirement as a suppressor variable because the standardized coefficient associated with this variable was large, whereas the corresponding structure coefficient was relatively small (Onwuegbuzie & Daniel, 2003). Also, reading vocabulary suggested multicollinearity because the structure coefficient associated with this variable was large, whereas the corresponding standardized coefficient was relatively small (Onwuegbuzie & Daniel, 2003). Interestingly, for both the standardized and structure coefficients, the interest/curiosity reason theme was negatively related to four other variables (i.e., gain knowledge, guidance, requirement, stay current).

A canonical correlation analysis also was undertaken to examine the relationship between the two reason meta-themes and the two reading ability variables, with the former set being treated as the dependent set of variables and the latter set being utilized as the independent multivariate profile. The canonical analysis revealed that the two canonical correlations combined were neither statistically significant ($p = .46$) nor practically significant (Canonical $R_{c2} = .13$). Thus, the standardized canonical function coefficients and structure coefficients were not interpreted.

Discussion

Step 10: Validating/legitimating the findings.

Validity of findings from quantitative phase. Threats both to internal validity and external validity prevailed with respect to the quantitative findings (Campbell, 1957; Campbell & Stanley, 1963; Onwuegbuzie, 2003b). The biggest threat to the internal validity of the quantitative findings was instrumentation because of the relatively low reliability coefficient (i.e., .69) pertaining to the reading comprehension scores, which can affect statistical power (Onwuegbuzie & Daniel, 2004). However, in the current study, perhaps this threat was minimal due to the finding that reading comprehension was not only a significant predictor of the reason themes but was a better predictor than was reading vocabulary. Nevertheless, replications of this study are needed to determine the generalizability of any findings associated with reading comprehension.

With regard to external validity, because the sample represented doctoral students at a single university (i.e., threat to population validity and ecological validity) from whom data were collected at a single point in time (i.e., threat to temporal validity), it is not clear the extent to which the present findings generalize beyond the sample to doctoral students from other institutions in other regions of the United States and beyond. However, bearing in mind the uniqueness of this population (i.e., doctoral students), the fact that this study involved more than 200 participants is notable.

Notwithstanding, replications of the present investigation are needed using a wide variety of doctoral students.

Legitimation of findings from qualitative phase. The biggest threats to the qualitative findings were descriptive validity (i.e., factual accuracy of the reasons provided by the

doctoral students) and interpretive validity (i.e., the extent to which a researcher's interpretation of the reasons provided represents an understanding of the students' perspectives and the meanings that they attach to their words and actions) (Maxwell, 1992, 2005; see also Onwuegbuzie & Leech, 2007). However, descriptive validity and interpretive validity were enhanced by member checking (Lincoln & Guba, 1985).

Also, the fact that all the themes secured endorsement rates that yielded at least small-to-medium effect sizes suggests that data saturation took place.

Legitimation of findings from the mixed research phase. Onwuegbuzie and Johnson (2006) identified nine legitimation types that are pertinent to mixed research. Each of these legitimation types is defined in Table 6, together with an explanation of how they were addressed in the current investigation. It can be seen that nine threats were addressed to some degree. Nevertheless, despite the extremely rigorous nature of the mixed research design, replications of this inquiry are needed to assess the reliability of the current findings.

Step 11: Interpreting the findings.

Stage 1 interpretations. The quantitative phase revealed that, on average, a significant proportion (18%) of doctoral students reported reading empirical research articles either never or only once a year. Another nearly one half of the participants reported reading empirical research articles only once per month. Considering the role that empirical research articles play in the social, behavioral, and health science fields, this finding is quite disturbing. Yet, in considering that Benge et al. (2010) found that 75% of the participants noted time as a barrier to reading empirical research, along with high endorsements ratings for interest/relevance and research knowledge, and McMinn et al. (2009) noted that time demands on students created a tension in completing assigned reading, perhaps this finding is not surprising. However, it is problematic and ought to be addressed in doctoral student education.

The number of empirical research articles that the doctoral students reported reading each month ranged from 0.5 to 50.00. Predictably, doctoral students who read empirical research articles at least once per week ($M = 14.28$, $SD = 11.99$) statistically significantly read more empirical research articles per month (t [99.5] = 4.33, $p < .0001$) than did their counterparts ($M = 7.19$, $SD = 7.82$), yielding a large Cohen's (1988) d effect size of 0.74. Thus, doctoral students who read more frequently also tended to read more empirical research articles.

Stage 2 and 3 interpretations. The constant comparison analysis revealed that the reasons for reading empirical research articles are multidimensional in nature. Specifically, from these reasons, the following five themes were extracted: requirement, gain knowledge, stay current, guidance, and interest/curiosity. Interestingly, the endorsement rates of all of these perception themes represented large effect sizes, indicating that these reasons are prevalent among doctoral students. Further, the range of reasons for reading empirical

Table 6. Typology of Mixed Methods Legitimation Types and Approaches Used to Minimize them.

Legitimation Type	Description	How Legitimation Type was Enhanced
Sample Integration	The extent to which the relationship between the quantitative and qualitative sampling designs yields quality meta-inferences.	Collecting both qualitative and quantitative data on the same group of student participants
Inside-Outside	The extent to which the researcher accurately presents and appropriately utilizes the insider's view and the observer's views for purposes such as description and explanation.	Capturing the participants' quantitative and qualitative data (i.e., insiders' views) and including doctoral students on the research team (observers' views)
Weakness Minimization	The extent to which the weakness from one approach is compensated by the strengths from the other approach.	Combining descriptive precision (i.e., stemming from qualitative analyses) with empirical precision (i.e., stemming from quantitative analyses)
Sequential	The extent to which one has minimized the potential problem wherein the meta-inferences could be affected by reversing the sequence of the quantitative and qualitative phases.	Collecting quantitative and qualitative data simultaneously (i.e., concurrently)
Conversion	The extent to which the quantitizing or qualitizing yields quality meta-inferences.	Obtaining verification of quantitizing of themes via member checking and analysis of audit trail.
Paradigmatic mixing	The extent to which the researcher's epistemological, ontological, axiological, methodological, and rhetorical beliefs that underlie the quantitative and qualitative approaches are successfully (a) combined or (b) blended into a usable package.	Using a fully mixed research design (Leech & Onwuegbuzie, 2009), as well as by undergoing all major steps of the mixed research process
Commensura-bility	The extent to which the meta-inferences made reflect a mixed worldview based on the cognitive process of Gestalt switching and integration.	Using a team of researchers that was diverse with respect to research training, research experience, research philosophy, college teaching experience (e.g., assistant professor, associate professor, and full professor titles all were represented), and discipline (e.g., literacy educator, research methodologist)
Multiple Validities	The extent to which addressing legitimation of the quantitative and qualitative components of the study result from the use of quantitative, qualitative, *and* mixed validity types, yielding high quality meta-inferences.	Using techniques (e.g., intercoder agreement, member checking, debriefing) that addressed as many threats to the legitimation of both the qualitative and quantitative findings as possible
Political	The extent to which the consumers of mixed methods research value the meta-inferences stemming from *both* the quantitative and qualitative components of a study.	Using rigorous qualitative and quantitative techniques

Note. This table was adapted from Onwuegbuzie and Johnson (2006). Reprinted with kind permission of the Mid-South Educational Research Association and the Editors of *Research in the Schools*.

research support the notion that doctoral students, as adult learners, are indeed a heterogeneous group. Perhaps, though, most compelling is that requirement and guidance received the highest endorsement ratings (i.e., 34.1%), thereby accentuating that context is an important aspect of adult learning (Merriam et al., 2006).

The five reason themes were statistically subdivided (i.e., via principal component analysis) into the following two meta-themes: professional and personal. The first meta-theme, professional, comprises guidance, requirement, and stay current. The construct of professional emerges from the idea that the reasons for reading empirical research seem professionally motivated; yet, these motivations to read are also both intrinsic and extrinsic and exemplify the interaction between structure and agency (Giddens, 1984). For example, reading empirical research to stay current is both a demand from an external source (e.g., necessary to be successful in profession—structure) and an internal desire (e.g., desire to be successful in profession—agency). Reading for guidance (e.g., models of writing, ideas for research, help with coursework, and help with teaching) also highlights the interaction between agency and structure in that the structure imposes demands and as actors in this structure, students seek help to meet these professional demands. Although reading as a requirement appears to be the most externally driven reason, agency, or internal desire still exists as students chose to pursue an advanced degree and thus read to fulfill their professional commitment.

Interestingly, requirement is negatively related to guidance and stay current. This finding suggests that students whose motivation to read empirical research is more externally imposed by their professional structure, are less likely to view reading empirical research as a mechanism to enact their agency within the structure. That is, these students seem to perceive reading empirical research as a requirement of their professional development rather than as a means to developing professionally.

The second meta-theme, personal, comprises gain knowledge and interest/curiosity. The construct of personal represents self-directed learning (Knowles, 1980; Merriam & Caffarella, 1999). Choosing to read empirical research to gain knowledge and/or out of interest seem to be intrinsically motivating reasons reflecting a desire of personal growth and autonomy. Not surprisingly, the two themes (i.e., gain knowledge and interest/curiosity) were negatively related, likely due to their shared meaning. Thus, if doctoral students cited one as a reason for reading empirical research, they were less likely to cite the other. It is important to keep in mind that these themes were generated from open-ended responses; and it is quite possible that the students generated a single idea to capture personal motivation. Thus, the negative relationship between these two themes juxtaposed with their large effects sizes within the same factor, strengthens the construct of personal motivation. However, it is also necessary to consider that these personal motivations do not necessarily exist in isolation and might indeed have professional consequences.

Stage 4 interpretations. Just as the reasons for reading empirical research reported by doctoral students are complex and multifaceted, so are the relationships found between these reasons and reading intensity. In considering the findings from the canonical correlations between the five reason themes and the reading intensity variables, namely, fre-

quency of reading empirical research articles and number of empirical research articles read each month, it seems clear that doctoral students' reasons for reading empirical research are significantly related to the frequency of their reading. The multivariate relationship between the five reason themes and the reading intensity variables (i.e., frequency of reading empirical research articles, number of empirical research articles read each month) was mainly characterized by the relationship between gain knowledge, requirement, and stay current on one side and frequency of reading empirical research articles on the other side. The negative relationship among some of the reasons, contextualized in the relationship with reading frequency, illustrate the interaction of structure and agency in motivation to read empirical research. That is, doctoral students who state that they read for interest/curiosity, gain knowledge, and requirement, read less frequently. In terms of interest/curiosity and gain knowledge, both of which are personal motivations, and the previous finding of 75% of these students citing time as a barrier to reading (Benge et al., 2010), it seems plausible that, without an imposed structure, doctoral students perceive less time for reading empirical research. Likewise, the negative relationship between reading as a requirement and frequency of reading could be characterized on the other end of the continuum of too much imposed structure in which doctoral students enact their agency by reading less.

In contrast, doctoral students who cite reading to stay current and for guidance, read more frequently, which exemplifies a balance in the structure and agency interaction and their pragmatic approach to learning. That is, the structure or external demand of staying current in their fields and their own professional development as students and practitioners sets the context for reading empirical research; yet, the reason for reading is pragmatic and enacted through agency.

The multivariate relationship between the five reason themes and the reading ability variables (i.e., reading vocabulary and reading comprehension) was mainly characterized by the relationship between gain knowledge, guidance, requirement, and stay current on one side and reading comprehension on the other side. Perhaps, and not unexpectedly, doctoral students with stronger comprehension abilities are more likely to read to fulfill their course requirements and to stay current. Further, they are more likely to read empirical research for guidance and to gain knowledge. Thus, in considering the range of reasons for reading, it seems that stronger readers are more adept at negotiating both external and internal motivations to read empirical research.

That a combination of themes was related to both the set of reading intensity variables and the reading ability variables but the meta-themes were not related either to the reading intensity variables or the reading ability variables, is perhaps best explained by the negative relationships between the two themes. The meta-theme constructs of personal and professional, although inclusive, comprise dichotomous reasons for reading.

This dichotomy is further supported in examining the profiles from the latent class analysis with reading empirical research as a requirement separating Cluster 2 students from Cluster 1 and Cluster 3 students as well as interest/curiosity separating Cluster 3 students from Cluster 1 and Cluster 2 students. The latent class analysis also provides an addition-

al view on the duality of agency and structure. That is, students in Cluster 2, who read because it is required, yet, as determined from canonical correlation, read less, might indeed be challenging the status quo, as they enact their agency within the structure as to challenge reproduction. However, students in Cluster 3, who read because it is required and also who read less, might potentially be reproducing the structure.

Step 12: Writing the mixed research report. The present findings have provided evidence that doctoral students undertake the reading of professional literature for reasons that are neither strictly professional nor personal, but complex and multifaceted. The fact that, to date, the exploration of doctoral students' reading behaviors has received so little attention in the reading literature or beyond supports our contention that this group of students represent an underserved population—hence our transformative-emancipatory stance. Thus, we hope that findings from the present study are disseminated to as many instructors and advisors of doctoral students as possible.

Step 13: Re-formulating the mixed research question. Based on the current findings, researchers in the future might consider addressing the following question: What is the relationship between doctoral students' reasons for reading empirical literature and their perceived barriers to reading empirical literature?

Conclusion

Doctoral students' reasons for reading empirical literature are both professional and personal. In informing their professional lives, they look at their reading as a requirement, one that both guides their practice and helps them to stay current. However, their reasons also are inherently personal, founded from a sense of interest and/or curiosity and the need to gain knowledge. Indeed, the findings from this study provide compelling evidence that doctoral students' reasons for reading empirical research not only play a role in how they see value in empirical research as a tool that can assist them in their professional lives and in whether they read research out of interest, but also play a role in how successfully (or unsuccessfully) they fulfill the reading requirements of their course of study. Therefore, it is important for teachers of doctoral students to consider that their reasons do not exist absent of context, but rather within the duality of how they enact agency within structure (cf. Giddens, 1984). Thus, the authors of this current study assert that programmatic, instructional, and curricular implications of doctoral programs in any discipline ought to be reexamined. That is, as pragmatic learners, doctoral students need a pragmatic approach to framing their studies. Further, master's-level programs also should be examined because many of these programs require students to read empirical articles toward framing and informing their own research projects.

Relying on the assumptions that all doctoral or master's students are both fully prepared for reading and are prepossessed of both professional and/or personal intrinsic motivations to read empirical literature is counterproductive and possibly detrimental to student success. By ascertaining both the levels of readiness and the desire that learners have toward their own learning, instructors can provide scaffolding of reading empirical research that aligns with these levels (see, for e.g., Grow, 1991). Further, knowing and understand-

ing students' initial professional and personal reasons for reading empirical literature will help instructors to utilize those reasons to design an instructional course that will foster students' growth as emergent scholars.

References

Barnacle, R. (2004). A critical ethic in a knowledge economy: Research degree candidates in the workplace. *Studies in Continuing Education, 26,* 355-367. doi:10.1080/0158037042000265926

Baumgartner, L. M., Lee, M., Birden, S., & Flowers, D. (2003). *Adult learning theory: A primer.* Retrieved from http://eric.ed.gov/ERICWebPortal/search/detailmini.jsp?_nfpb=true&_&ERICExtSearch_SearchValue_0=ED482337&ERICExtSearch_SearchType_0=no&accno=ED482337.

Benge, C., Onwuegbuzie, A. J., Mallette, M. H., & Burgess, M. L. (2010). Doctoral students' perceptions of barriers to reading empirical literature: A mixed analysis. *International Journal of Doctoral Studies*, *5*, 55-77.

Bowen, W. G., & Rudenstine, N. L. (1992). *In pursuit of the Ph.D*. Princeton, NJ: Princeton University Press.

Brown, J. I., Fishco, V. V. & Hanna, G. (1993). *Nelson-Denny Reading Test: Manual for scoring and interpretation, Forms G and H*. Itasca, IL: Riverside Publishing.

Campbell, D. T. (1957). Factors relevant to the validity of experiments in social settings. *Psychological Bulletin, 54*, 297-312. doi:10.1037/h0040950

Campbell, D. T., & Stanley, J. C. (1963). *Experimental and quasiexperimental designs for research*. Chicago, IL: Rand McNally.

Caracelli, V. W., & Greene, J. C. (1993). Data analysis strategies for mixed-methods evaluation designs. *Educational Evaluation and Policy Analysis*, *15*, 195-207. doi:10.2307/1164421

Cattell, R. B. (1966). The scree test for the number of factors. *Multivariate Behavioral Research, 1*, 245-276. doi:10.1207/s15327906mbr0102_10

Cesari, J. P. (1990). Thesis and dissertation support groups: A unique service for graduate students. *Journal of College Student Development, 31*, 375–376.

Cliff, N., & Krus, D. J. (1976). Interpretation of canonical analyses: Rotated vs. unrotated solutions. *Psychometrica, 41,* 35-42. doi:10.1007/BF02291696

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.) Hillsdale, NJ: Erlbaum**.**

Collins, K. M. T., Onwuegbuzie, A. J., & Sutton, I. L. (2006). A model incorporating the rationale and purpose for conducting mixed methods research in special education and beyond. *Learning Disabilities: A Contemporary Journal, 4,* 67-100.

Constas, M. A. (1992). Qualitative data analysis as a public event: The documentation of category development procedures. *American Educational Research Journal, 29,* 253-266.

Darlington, R. B., Weinberg, S. L., & Walberg, H. J. (1973). Canonical variate analysis and related techniques. *Review of Educational Research, 42,* 131-143. doi:10.3102/00346543043004433

Evans, T. (2002). Part-time research students: are they producing knowledge where it counts? *Higher Education Research and Development, 21*, 155-165. doi**:**10.1080/07294360220144079

Evans, T. D., & Pearson, M. (1999). Off-campus doctoral research in Australia: emerging issues and practices. In A. Holbrook & S. Johnston (Eds.), *Supervision of postgraduate research in education* (pp. 185–206). Coldstream, Victoria: Australian Association for Research in Education.

Giddens, A. (1984). *The constitution of society: Outline of the theory of structuration.* Berkley, CA: University of California Press.

Glaser, B. G., & Strauss, A. L. (1967). *The discovery of grounded theory: Strategies for qualitative research.* Chicago, IL: Aldine.

Goetz, J. P., & LeCompte, M. D. (1984). *Ethnography and the qualitative design in educational research.* New York, NY: Academic Press.

Golde, C. M. (2005). The role of the department and discipline in doctoral student attrition: lessons from four departments. *The Journal of Higher Education 76*, 669-700. doi:10.1353/jhe.2005.0039

Grady, M., & Hoffman, S. (2007). *Guiding the dissertation proposal: A student advocacy approach.* Retrieved from http://cnx.org/content/m14736/1.1/

Greene, J. C., Caracelli, V. J., & Graham, W. F. (1989). Toward a conceptual framework for mixed-method evaluation designs. *Educational Evaluation and Policy Analysis, 11*, 255-274. doi:10.2307/1163620

Grow, G. (1991). Teaching learners to be self-directed. *Adult Education Quarterly, 41*, 125-149. doi:10.1177/0001848191041003001

Henson, R. K., Capraro, R. M., & Capraro, M. M. (2004). Reporting practice and use of exploratory factor analysis in educational research journals: Errors and explanation. *Research in the Schools, 11*(2), 61-72.

Henson, R. K., & Roberts, J. K. (2006). Use of exploratory factor analysis in published research. *Educational and Psychological Measurement, 66*, 393-416. doi:10.1177/0013164405282485

Hetzel, R. D. (1996). A primer on factor analysis with comments on patterns of practice and reporting. In B. Thompson (Ed.), *Advances in social science methodology* (Vol. 4, pp. 175-206). Greenwich, CT: JAI Press.

Johnson, R. B. (2011). Dialectical pluralism: A metaparadigm to help us hear and "combine" our valued differences. In S. J. Hesse-Biber (Chair), *Addressing the Credibility of Evidence in Mixed Methods Research: Questions, Issues and Research Strategies.* Plenary conducted at the meeting of Seventh International Congress of Qualitative Inquiry, University of Illinois at Urbana-Champaign.

Johnson, R. B., & Christensen, L. (2010). *Educational research: Quantitative, qualitative, and mixed approaches* (4th ed.). Thousand Oaks, CA: Sage.

Johnson, R. B., & Onwuegbuzie, A. J. (2004). Mixed methods research: A research paradigm whose time has come. *Educational Researcher*, *33*(7), 14-26. doi:10.3102/0013189X033007014

Johnson, R. B., & Turner, L. A. (2003). Data collection strategies in mixed methods research. In A. Tashakkori, & C. Teddlie (Eds.), *Handbook of mixed methods in social and behavioral research* (pp. 297-319). Thousand Oaks, CA: Sage.

Kaiser, H. F. (1958). The varimax criterion for analytic rotation in factor analysis. *Psychometrika, 23,* 187–200. doi:10.1007/BF02289233

Kieffer, K. M. (1999). An introductory primer on the appropriate use of exploratory and confirmatory factor analysis. *Research in the Schools*, *6*(2), 75–92.

Knowles, M. S. (1968). Andragogy, not pedagogy! *Adult Leadership, 16*, 350-352, 386.

Knowles, M. S. (1980). *The modern practice of adult education: From pedagogy to andragogy* (2nd ed.). Englewood Cliffs, NJ: Cambridge Adult Education.

Knowles, M. S., Holton III, E. F., & Swanson, R. A. (2005). *The adult learner.* (6th Edition). Boston, MA: Elsevier.

Lambert, Z. V., & Durand, R. M. (1975). Some precautions in using canonical analysis. *Journal of Market Research, XII,* 468-475. doi:10.2307/3151100

Leech, N. L., Collins, K. M. T., Jiao, Q. G., & Onwuegbuzie, A. J. (2010, February). *A mixed research investigation of trends in the gifted education literature*. Paper presented at the annual meeting of the Southwest Educational Research Association, New Orleans, LA.

Leech, N. L., & Onwuegbuzie, A. J. (2007). An array of qualitative data analysis tools: A call for qualitative data analysis triangulation. *School Psychology Quarterly, 22*, 557-584. doi:10.1037/1045-3830.22.4.557

Leech, N. L., & Onwuegbuzie, A. J. (2009). A typology of mixed methods research designs. *Quality & Quantity: International Journal of Methodology*, *43*, 265-275. doi:10.1007/s11135-007-9105-3

Leech, N. L., Onwuegbuzie, A. J., & Combs, J. C. (2011). Writing publishable mixed research articles: Guidelines for emerging scholars in the health sciences and beyond. *International Journal of Multiple Research Approaches*, *5*, 7-24.

Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry.* Beverly Hills, CA: Sage.

Maxwell, J. A. (1992). Understanding and validity in qualitative research. *Harvard Educational Review, 62,* 279–299.

Maxwell, J. A. (2005). *Qualitative research design: An interactive approach* (2nd ed.). Newbury Park, CA: Sage.

McAlpine, L., & Norton, J. (2006). Reframing our approach to doctoral programs: An integrative framework for action and research. *Higher Education Research and Development, 25*(1), 3-17. doi:10.1080/07294360500453012

McMinn, M. R., Tabor, A., Thrihub, B. L., Taylor, L., & Dominguez A. W. (2009). Reading in graduate school: A survey of doctoral students in clinical psychology. *Training and Education in Professional Psychology*, *3*, 233–239. doi:10.1037/a0016405

Merriam, S. B., & Caffarella, R. S. (1999). *Learning in adulthood: A comprehensive guide* (2nd ed.). San Francisco, CA: Jossey-Bass.

Merriam, S. B., Caffarella, R. S., & Baumgartner, L. M. (2006). *Learning in adulthood: A comprehensive guide* (3rd ed.). Indianapolis, IN: Jossey-Bass.

Mertens, D. (2003). Mixed methods and the politics of human research: The transformative-emancipatory perspective. In A. Tashakkori & C. Teddlie (Eds.), *Handbook of mixed methods in social and behavioral research* (pp. 135-164). Thousand Oaks, CA: Sage.

Morgan, D. L. (2007). Paradigms lost and pragmatism regained: Methodological implications of combining qualitative and quantitative methods. *Journal of Mixed Methods Research, 1*, 48-76. doi:10.1177/2345678906292462

Moustakas, C. (1994). *Phenomenological research methods*. Thousand Oaks, CA: Sage.

Neumann, R. (2003). *The doctoral education experience: Diversity and complexity*. Canberra, Australia: Department of Education.

Newman, I., Ridenour, C. S., Newman, C., & DeMarco, G. M. P. (2003). A typology of research purposes and its relationship to mixed methods. In A. Tashakkori & C. Teddlie (Eds.), *Handbook of mixed methods in social and behavioral research* (pp. 167-188)*.* Thousand Oaks, CA: Sage.

Onwuegbuzie, A. J. (2003a). Effect sizes in qualitative research: A prolegomenon. *Quality & Quantity: International Journal of Methodology, 37*, 393-409. doi:10.1023/A:1027379223537

Onwuegbuzie, A. J. (2003b). Expanding the framework of internal and external validity in quantitative research. *Research in the Schools, 10*(1), 71-90.

Onwuegbuzie, A. J., & Collins, K. M. T. (2007). A typology of mixed methods sampling designs in social science research. *The Qualitative Report, 12*, 281-316. Retrieved from http://www.nova.edu/ssss/QR/QR12-2/onwuegbuzie2.pdf

Onwuegbuzie, A. J., & Daniel, L. G. (2003, February 12). Typology of analytical and interpretational errors in quantitative and qualitative educational research. *Current Issues in Education* [Electronic version], 6(2). Retrieved July 15, 2010, from http://cie.ed.asu.edu/volume6/number2/

Onwuegbuzie, A. J., & Daniel, L. G. (2004). Reliability generalization: The importance of considering sample specificity, confidence intervals, and subgroup differences. *Research in the Schools, 11*(1), 60-71.

Onwuegbuzie, A. J., & Johnson, R. B. (2006). The validity issue in mixed research. *Research in the Schools, 13*(1), 48-63.

Onwuegbuzie, A. J., Johnson, R. B., & Collins, K. M. T. (2009). A call for mixed analysis: A philosophical framework for combining qualitative and quantitative approaches. *International Journal of Multiple Research Approaches*, *3*, 114-139.

Onwuegbuzie, A. J., & Leech, N. L. (2004). Enhancing the interpretation of "significant" findings: The role of mixed methods research. *The Qualitative Report, 9,* 770-792. Retrieved from http://www.nova.edu/ssss/QR/QR9-4/nwuegbuzie.pdf

Onwuegbuzie, A. J., & Leech, N. L. (2007). Validity and qualitative research: An oxymoron? *Quality & Quantity: International Journal of Methodology, 41*, 233-249. doi:10.1007/s11135-006-9000-3

Onwuegbuzie, A. J., & Teddlie, C. (2003). A framework for analyzing data in mixed methods research. In A. Tashakkori & C. Teddlie (Eds.), *Handbook of mixed methods in social and behavioral research* (pp. 351-383). Thousand Oaks, CA: Sage.

Onwuegbuzie, A. J., Witcher, A. E., Collins, K. M. T., Filer, J. D., Wiedmaier, C. D., & Moore, C. W. (2007). Students' perceptions of characteristics of effective college teachers: A validity study of a teaching evaluation form using a mixed-methods analysis. *American Educational Research Journal, 44*, 113-160. doi:10.3102/0002831206298169

Pearson, M., Evans, T., & Macauley, P. (2004). The working life of doctoral students: Challenges to traditional conceptions of research education and training, *Studies in Continuing Education*, *26*, 347-353.

Pearson, M., & Ford, L. (1997). *Open and flexible PhD study and research*. Canberra, Australia: Department of Employment, Education, Training and Youth Affairs.

Smallwood, S. (2006). Driven by foreign students, doctoral degrees are up 2.9% in 2005. *The Chronicle of Higher Education, 53*(15), p. A12.

Tabachnick, B. G., & Fidell, L. S. (2006). *Using multivariate statistics* (5th ed.). New York, NY: Harper & Row.

Tashakkori, A., & Teddlie, C. (1998). *Mixed methodology: Combining qualitative and quantitative approaches (Applied Social Research Methods Series, Vol. 46).* Thousand Oaks, CA: Sage.

Thompson, B. (1980, April). *Canonical correlation: Recent extensions for modeling educational processes*. Paper presented at the annual meeting of the American Educational Research Association, Boston, MA.

Thompson, B. (1984). *Canonical correlation analysis: Uses and interpretations.* Newbury Park, CA: Sage. (ERIC Document Reproduction Service No. ED199269)

Thompson, B. (1988, April). *Canonical correlation analysis: An explanation with comments on correct practice.* Paper presented at the annual meeting of the American Educational Research Association, New Orleans, LA. (ERIC Document Reproduction Service No. ED295957)

Thompson, B. (1990, April). *Variable importance in multiple regression and canonical correlation.* Paper presented at the annual meeting of the American Educational Research Association, Boston, MA. (ERIC Document Reproduction Service No. ED317615)

Usher, R. (2002). A diversity of doctorates: Fitness for the knowledge economy. *Higher Education Research and Development, 21*, 143-153. doi:10.1080/07294360220144060

Zwick, W. R., & Velicer, W. F. (1986). Comparison of five rules for determining the number of components to retain. *Psychological Bulletin, 99*, 432-442. doi:10.1037/0033-2909.99.3.432