

THE RELATIONSHIP BETWEEN RESEARCH SELF-EFFICACY, PERCEPTIONS OF THE
RESEARCH TRAINING ENVIRONMENT AND INTEREST IN RESEARCH IN
COUNSELOR EDUCATION DOCTORAL STUDENTS: AN EX-POST-FACTO,
CROSS-SECTIONAL CORRELATIONAL INVESTIGATION

by

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ABSTRACT

The purpose of this study was to investigate the relationship between research self-efficacy (as measured by the Research Self-Efficacy Scale [Greeley et al., 1989]), perceptions of the research training environment (as measured by the Research Training Environment Scale – Revised [Gelso et al., 1996]), and interest in research (as measured by the Interest in Research Questionnaire [Bieschke & Bishop, 1994]) within a national sample of doctoral counselor education students ($N = 89$). Additionally, the study investigated whether there were differences between levels of research self-efficacy, perceptions of the research training environment, and interest in research in relation to the demographic characteristics (i.e., age, gender, race/ethnicity, scholarly productivity, reported professional aspirations, and number of doctoral-level research courses completed) of counselor education doctoral students. An ex-post facto, cross-sectional design was implemented which included the following statistical analyses: Pearson's correlation coefficients (two-tailed), simultaneous multiple regression, and analysis of variance (ANOVA).

Findings identified that the demographic variables of age and doctoral-level research courses completed had a statistically significant effect upon perceptions of the research training environment. In addition, results suggested that scholarly activity had a statistically significant effect on research self-efficacy scores. Finally, interest in research was positively correlated with research self-efficacy scores. In summary, the study addressed the present void in the counselor education literature with regard to counselor education doctoral students' development in the areas of research self-efficacy, perceptions of the research training environment, and interest in research.

In order to contribute to the counselor education literature and support doctoral student development, it is crucial that counselor education doctoral training programs provide an

effective research training environment to foster and encourage student research. Recognizing and appreciating the influence of counselor education doctoral students' research self-efficacy, perceptions of the research training environment, and interest in research may not only be important for students, but is also necessary for counselor education doctoral preparation programs to continue to develop and prepare students for academic positions and success. Study findings may provide beneficial information to assist colleges and universities to develop and tailor policies to encourage and foster research amongst their doctoral counselor education students.

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CHAPTER ONE: INTRODUCTION

“Dissemination of research findings and sharing clinical perspectives are foundational to counselor education and in enhancing the profession of counseling. According to the Council for Accreditation of Counseling and Related Educational Programs (2001), counselor preparation programs should promote the ‘use of research to improve counseling effectiveness’ (Section II, K.8.e.)” (Lambie, Sias, Davis & Akos, 2008, p. 18). The *Ethical Standards for School Counselors* of the American School Counselor Association (ASCA, 2004) states that an ethical counseling professional “conducts appropriate research and reports findings in a manner consistent with acceptable educational and psychological research practices” (ASCA standard F.1.c). Finally, the American Counseling Association’s (ACA, 2005) *Code of Ethics* states that ethical “counselors report the results of any research they judge to be of professional value, results that reflect unfavorably on institutions, programs, services, prevailing opinions, or vested interests are not withheld” (ACA standard G.4.b). “Therefore, scholarly writing is not only an academic exercise, but rather an ethical and professional responsibility for all counseling professionals.” (Lambie et al., p. 18).

The counselor education literature has shown a paucity of research using the constructs of research activity and counselor education doctoral students (Briggs, 2006; Miller, 2006; Reisetter et al., 2004). This lack of robust research activity has been a concern within the counselor education field for over two decades (Galassi, 1989; Gelso, 2006; Eisenhart & Dehaan, 2005; Okech, Agramovich, Johnson, Hoskins, & Rubel, 2006; Robinson, 1984; Royalty & Magoon, 1985). Additionally, the literature indicates that the research training of counselor educators and doctoral students is an area of concern (Fong & Malone, 1994; Kline & Farrell, 2005; Lundervold & Bellwood, 2000; Zimpher, 1993). Therefore, research that investigates constructs

relating to the research development of counselor education doctoral students is both necessary and timely (Clawson, Henderson, Schweiger, & Collins, 2004; Jones, 2006; Miller, 2006). Due to the lack of research in counselor education, the field of counseling psychology is also explored with regard to research activity and doctoral students.

Despite the emphasis on training doctoral students to become both scientists and practitioners (Geisler, 1995; Horn et al., 2007; Stoltenberg et al., 2000), research supports the premise that counseling psychology doctoral students demonstrate low levels of research productivity (Bieschke, 2006; Gelso, 2006; Kahn, 2001; Gelso, Mallinkrodt & Judge, 1996; Royalty & Reising, 1986; Shivy et al., 2003). Most counseling psychology doctoral students, following their graduation, become clinical practitioners and relatively few pursue research activities (Belar, 2000; Gelso & Lent, 2000; Zachar & Leong, 2000). In an effort to increase research involvement in the counseling field, many researchers have looked at the issue of training in research through both empirical and conceptual lenses (Brown, Lent, Ryan, & McPartland, 1996; Galassi, 1989; Gelso, Mallinkrodt & Judge, 1996; Kahn & Scott, 1997). Therefore, research training of doctoral students is integral to creating scientist-practitioners and in turn, creating advancements in the field.

The Importance of Research

The scientist-practitioner model (otherwise known as the Boulder model) is the traditional paradigm found in Ph.D. degree programs that seek to combine research and scientific inquiry with clinical work (Benjamin & Baker, 2000; Silvera, Laeng & Dahl, 2003). Primary to the scientist-practitioner model is the belief that research is what develops a profession (Belar, 2000). Research production and publication are important to the field of counseling, not only because research supports and encourages the scientist-practitioner model, but it also contributes

to the body of literature (findings and theories) on which practitioners base their services (Belar, 2000; Granello & Granello, 1998; Kahn, 2001; Stoltenberg, Kashubeck-West, Biever, Patterson, & Welch, 2000). Additionally, research training is essential in order to be a successful academic (Follette & Klesges, 1988; McGrail, Rickard & Jones, 2006, Zimpher, Cox, West, Bubenzer, & Brooks, 1997). In summary, research supports the importance of research training in order to stimulate interest in research activities.

Granello and Granello (1998) noted the importance of incorporating evidence-based research in counselor education scholarship as it serves to promote effective and quality counseling practice. Chwalisz (2003) emphasized that embracing an identity of evidenced-based practitioners is crucial for advancement of the field. According to Gelso and Lent (2000), research training is considered critical for two primary reasons: (a) research furthers the knowledge base in the counseling field, in addition to ensuring that the foundation for future knowledge in the field exists; and (b) research is the key to providing direction to clinicians with regard to therapeutic interventions.

Galassi (1989) noted that the key to maintaining a distinct professional identity rests upon present and future contributions to theory and research in the counseling field. Therefore, research in the counseling field must be ongoing in order for the profession to thrive and flourish (Belar, 2000; Schulman et al, 2006; Sprenkle, 2003). Falvey (1991) asserted that research is not an integral role in the identities of counselors and strongly encouraged the profession to adopt solid research competencies. Magoon and Holland (1984) advocated the need for sufficient number of researchers in the counseling profession in order to generate and test new ideas and practices, and to support professional accountability and ongoing development. Additionally, Gelso (2006) noted that faculty who were enthusiastic, modeled respect for the scientific method

and who were ethical and motivated in their own research, were more likely to become positive influences on doctoral students. According to Briggs (2006), mentors who were excited about their own research influenced their mentees to become enthusiastic about research as well.

Research preparation is not only vital on a collective level for the counseling profession, rather, it is also significant to the professional development of doctoral students in the counseling field (Gelso, 2006). Belar (2000) indicated that training doctoral students to conduct and publish sound research assisted them in developing and enhancing critical thinking skills, which also positively influenced their clinical judgment. Additionally, through supporting doctoral counseling students to develop a research line (or lines) during their doctoral program, counselor education programs may encourage them to contribute to the scholarly literature (Miller, 2006; Ramsey et al., 2002).

Scholarly Publication

Academics are expected to publish in strong, nationally refereed journals (Glatthorn, 2002). McGrail, Rickard and Jones (2006) noted that promotions in academia were often based on a successful record of scholarly publications. Traditional motivation to publish articles, such as scientific inquiry and the importance of disseminating knowledge in nationally refereed journals remains important. Yet, in the current university climate “publication rates are used as both an indicator of individual and institutional performance and are important criteria in achieving external funding from government and other professional bodies” (McGrail et al. & Jones, 2006, p. 19). Therefore, having students and/or faculty members publish articles in nationally refereed journals not only improves the standings of the individual researcher, but also improves the credibility and image of the university as well.

Wilson (2001) suggested that junior faculty members (non-tenured faculty) needed to be involved in scholarly research in order to both maintain their academic positions and to advance within the academic hierarchy. According to Wilson:

The bar for tenure is rising at major research universities and teaching institutions alike. Most departments demand more published research -- either articles or books, or both. Some institutions even accelerate the whole procedure, sizing up young scholars years before tenure time and showing them the door if it looks as if they won't eventually measure up. (p. 12)

Love, Bahner, Jones, and Nilsson (2007) supported the idea that students who published scholarly works during their time as doctoral students had an advantage of being looked upon favorably in the hiring process. Love and colleagues found that students who had access to effective research mentorship were more likely to become involved in research activities than those who were not exposed to such mentoring.

Many researchers have offered suggestions for addressing the issue of preparing doctoral students to become researchers (Eisenhart and Dehaan, 2005; Heathcott, 2007; Loughhead, 1991; Richardson, 2006; Schulman, Golde, Bueschel & Garabedian., 2006; Shavelson & Towne, 2002). Eisenhart and Dehaan (2005) advocated an approach that immerses students into a “culture of science” (p. 3) and encourages them to pursue scientific inquiry. They point to the following areas where programs might consider concentrating their research training efforts: (a) core research courses, (b) research experience, (c) teaching experience, and (d) interdisciplinary collaborations. Falvey (1991) suggested that programs offer pre-service and in-service research training to doctoral students, with a focus on research that is relevant to clinical settings. Briggs (2006) highlighted the fact that pre-tenured faculty thrived with effective research mentoring. In

summary, a student's preparation and environment may have a significant impact on their research courses, research experience, teaching experience and interdisciplinary collaborations.

One institution that is committed to the preparation of doctoral student researchers is The Carnegie Foundation for the Foundation of Teaching, the sponsor for the Carnegie Initiative on the Doctorate (CID) project (Shulman et al., 2006). This is a multi-year research program whose aim is to enrich and stimulate doctoral education (Golde & Walker, 2006). The CID strives to create "stewards of the discipline" who are capable of "generating new knowledge, conserving the most important ideas and findings of current and past work and transforming knowledge into powerful pedagogies of engagement, understanding and application" (Nyquist, 2002, p. 16).

Briggs (2006) surveyed 319 pre-tenured faculty members in CACREP accredited programs using a researcher developed instrument (Research Mentor Quality Questionnaire, RMQQ; Briggs, 2006). Results suggested that participants benefited from mentorship both in relation to producing scholarly work as well as receiving career guidance. Briggs found that 77% of the respondents collaborated on scholarly endeavors with their mentors. Of those that did receive mentorship, 68% partnered with a research mentor in order to publish in refereed journals, while 52% collaborated on national presentations. Briggs also found that 35% of the participants received assistance from their research mentors in creating book chapters while 22% and 21% collaborated with mentors on presentations and grants, respectively.

Briggs (2006) suggested that a higher proportion of female students received juried publications as well as on campus grants than male students. One limitation of the study was that it was conducted using a web-based platform which resulted in technical difficulties for some participants. The use of an online survey instrument possibly hindered the response rate as some respondents may not have been comfortable with or had access to Internet technology.

Additionally, Briggs noted that the survey instrument did not provide a clear distinction between the words “juried” and “referred”, which respondents indicated was confusing. Furthermore, Briggs noted that the Institutional Review Board (IRB) number was not included in the consent form or on the survey instruments, indicating that this may have lowered the credibility of the research in the eyes of the participants. The study contributes to the counselor education literature as findings provided evidence that pre-tenured faculty benefited from mentorship both in relation to producing scholarly work as well as receiving career guidance.

Several studies offer insight into the relationship between research productivity and counseling psychology doctoral students. Mallinkrodt, Royalty and Gelso (1990) surveyed 358 counseling psychology doctoral students in 10 American Psychological Association (APA) accredited programs by implementing a stratified random sampling method, in order to determine change in research interest (as measured by the Research Training Environment Scale [RTES; Royalty et al., 1986]; and the Vocational Preference Inventory-Form B (VPI-B; Holland, 1978) due to the following variables: Holland personality type, research training environment (RTE) and environment/personality interactions. Findings indicated that the investigative personality type and some personality/environment interactions had the most impact on levels of research interest. The researchers also found that “person variables (Holland type), training environment variables, and person-environment interactions may all influence changes in research interest” (Mallinkrodt et al., p. 32). Those participants with the Enterprising personality type had lower levels of research interest. The researchers found that personality factors had the most influence on interest in research. The above findings have implications for the current study due to the fact that it is also exploring the interest in research construct and using a revised form of the RTES instrument. One of the possible limitations of the study was that the self-reported

information collected from the survey instruments was assumed to accurately measure the perceptions of the participants. In other words, the researchers assumed that the responses provided by the students were representative of their feelings and perceptions. Another limitation of the study was that “the construct validity and other psychometric properties of RTES and the measures of research interest have not been extensively examined” (Mallinkrodt et al., 1990, p. 29).

Kahn and Scott (1997) performed a cross-sectional study using a sample of 267 counseling psychology doctoral students selected from 15 randomly chosen APA accredited counseling psychology programs. The instruments utilized included (a) the Vocational Preference Inventory Form-B (VPI-B; Holland, 1985), (b) the Research Training Environment Scale (RTES-R; Gelso et al., 1996), and (c) the Self-efficacy in Research Measure (SERM; Phillips & Russell, 1994). Results indicated that career goals and research productivity could be predicted via interest in research, research self-efficacy, personality type, and perceptions of the research training environment. Additionally, the researchers determined that the student’s year in program and gender assisted in predicting the outcome variables mentioned above. Additional findings suggested that research productivity was found to be significantly predicted by both research interest and number of years in the program ($R^2 = .63$) while the career goals of the participant were only predicted by the research interest scores ($R^2 = .37$) (Kahn & Scott, 1997). There were some notable limitations to this research study. There was a 55% response rate; and therefore, Khan and Scott (1997) noted that generalizing the results was a potential issue. Another limitation was that students in a given program may share similar qualities, despite random sampling. Khan and Scott noted that “as a consequence the error variance of variables may be reduced, thus increasing the likelihood of finding a significant relationship in regression

analysis” (p.64). Some of the limitations presented in the study have implications for the current study, since both studies utilized survey research, and the response rate and representativeness of the sample to the target population may be an area of limitation.

Phillips and Russell (1994) examined the relationship between research self-efficacy, the research training environment, and research productivity with 125 counseling psychology graduate students responding to surveys that were distributed to counseling centers at several universities in which graduate students were employed. The data collection instruments for this study included the RTES (Gelso et al., 1996), the Self Efficacy Research Measure (SERM; Phillips & Russell, 1994), and a researcher-developed demographic and research productivity questionnaire. Study results identified a significantly positive relationship between research self-efficacy and the research training environment (RTE), and between the productivity and self-efficacy variables. There was no significant relationship between the RTE and research productivity identified for this data. A limitation of this research was that the study employed a correlational research design and thus does not allow causal relationships to be inferred between the variables. Therefore, one would not be able to say that an increase in productivity caused the research self-efficacy of the student to increase as well. Another limitation was there was not a provision for dealing with the variables of ability and interest in this study. Nevertheless, these findings support the fact that the research self-efficacy of the students had a significant impact on the research training environment and research productivity of the participants.

Kahn (2001) investigated the predictive scholarly activity of counseling psychology students with a national convenience sample of 149 counseling psychology doctoral students in order to test and refine the *Model of Scholarly Activity* developed by Kahn and Scott (1997). Students were chosen were chosen from 12 randomly selected APA-accredited counseling

psychology programs. Kahn examined the relationship between the variables of the research training environment (as measured by the Research Training Scale-Revised; RTES-R; Royalty et al., 1996), mentoring (as measured by the Mentoring Functional Scale; Noe, 1988), research self-efficacy (as measured by using a researcher-developed 12-item version of the SERM; Phillips & Russell, 1994), and research outcome expectations (as measured by the Research Outcome Expectations Questionnaire, ROEQ; Bishop & Bieschke, 1998). The findings revealed an indirect effect of the research training environment on scholarly activity through research self-efficacy and research interest. The students' mentoring relationships did not have an appreciable effect on these outcomes. Other results supported that research self-efficacy and research outcome expectations assisted in mediating the relationships between perceptions of the research training environment and students' investigative interests on scholarly productivity and interest in research. The research outcome expectations were found to be predicted by the investigative interests and the perceptions of the research training environment. In each case, the relationships between these variables were significant, indicating that as the investigative interests or the perceptions of the research training environment increased so did the research outcome expectations of the participants. One of the possible limitations was that "perceptions of the research training environment and the mentoring relationship may appear quite different if reported by faculty members or individual mentors" (Kahn, 2001, p. 353). Therefore, the sample collected for the study was limited to the information from students as students may have different opinions from those expressed by faculty members and mentors. In addition, Kahn noted that with the mentoring measure, students had the liberty to identify with any faculty member, regardless of whether that person had an effect on research interest or efficacy. Kahn suggested that "focused research on the specific roles of a mentor in graduate training would be a

useful follow up to this study” (p. 32). This limitation may have implications for the current study due to the fact that faculty members and doctoral students may have different perspectives and therefore, this would be something to note.

Jones (2006) examined the impact of mentoring (research and faculty) on the research productivity (as measured by using a 12-item version of the Self-efficacy Research Measure [SERM; Kahn & Scott, 2001], research self efficacy [as measured by the Research Self-efficacy Scale-Revised; RSES-R; Greely et al., 1989], and satisfaction with graduate training program [as measured by the Graduate Student Satisfaction Questionnaire [GSSQ; Field & Giles, 1980]) of counseling psychology doctoral students. The sample comprised 142 counseling psychology doctoral students (in their second year or higher) from 50 APA-accredited programs. Students were selected based on a convenience sampling method in which online surveys were sent to counseling psychology program coordinators who distributed the online link to students in their program. The results suggested that 54.5% ($n = 77$) of the sample reported having faculty mentorship and 30.6% ($n = 43$) indicated that they had both a faculty and research mentor. The study supported Jones’ hypothesis that effective research mentoring was a predictor of counseling psychology students’ satisfaction with their graduate training program. It was also found that based on independent sample t-tests, that there were no significant differences between the gender of the participants in terms of research self-efficacy, research productivity and interest in research. Similarly, one-way analyses of variances (ANOVA) revealed that there were no significant differences for the number of years in the program when looking at the satisfaction with graduate program, self-efficacy, interest in research, research productivity, and life satisfaction scores. One of limitations of Jones’ (2006) study was that the sample was self-selected, meaning that students chose to participate. Jones noted that “students with low self-

efficacy could have avoided the completion of this study” (p. 58). Also, the study consisted predominantly of Caucasian females indicating that the generalization towards the male population would not be appropriate due to the limited number of male participants nor could it be generalizable to other ethnicities for the same reason. This is one concern that would have implications in the current study if there was not an even distribution between male and female respondents and ethnicities. The study contributes to the counseling psychology literature as it provides evidence that effective research mentoring is a predictor of counseling psychology students’ satisfaction with graduate training programs.

Hollingsworth and Fassinger (2002) investigated the role of faculty mentoring in the research training of counseling psychology doctoral students. The researchers surveyed 194 counseling psychology doctoral students enrolled in 25 APA accredited programs (who were in their third and fourth years of study) via a convenience sampling method. The findings suggested that the research training environment (as measured by a modified version of the RTES-R (Gelso et al, 1996) predicted the students’ experiences with research mentoring (as measured by the Research Mentoring Experience Scale (RMES; Hollingsworth & Fassinger, 2002) and their research self-efficacy (as measured by a shortened version of the SERM; Phillips & Russell, 1994). To determine the size of the effect that each of the variables had on one another, correlation coefficients were analyzed. Results indicated that the research training environment was positively correlated to the students’ research mentoring experiences ($r = .46$) as well as to their research self-efficacy ($r = .34$). Additionally, it was established that there was a small, significant relationship between the research training environment and the research productivity of the students ($r = .19$). In each case, the relationship between the variables was significant (at the .05 level of significance). The relationships between the research training environment and

the students' mentoring experiences as well as the relationship between the research training environment and research self-efficacy, indicated that there was a medium effect observed between these variables. One of the constraints of the Hollingsworth and Fassinger study (2002) was the fact that the researchers created one of the instruments used in the study (the Research Mentoring Experiences Scale [RMES]). The RMES demonstrated an adequate level of reliability in the study (Chronbach's alpha of .74), but the data generated concerned the researchers as the instrument did not have an established record of validity and reliability in the literature. In addition, all of the measures relied on self-report by the participants. Hollingsworth and Fassinger indicated that "the data did not corroborate students' perceptions of the research training environment, research productivity or their mentoring relationships from other sources and additional research would greatly benefit from study of paired observations regarding these variables" (p. 329). In summary, the study by Hollingsworth and Fassinger provided evidence that correlations existed between the research training environment and the students' experiences, the research self-efficacy and the research productivity of the students.

Miller (2006) surveyed counselor education doctoral students ($n = 103$) via a convenience sampling method. The research examined the relationship between scholarly activity and intrinsic and extrinsic goal aspirations. The data collection instruments included: (a) Doctoral Student Scholarly Activity Survey (DSSAS; Miller, 2006), (b) Aspirations Index (AI; Kasser & Ryan, 1996), and (c) Perceived Autonomy Support: The Learning Climate Questionnaire (LCQ; Williams, Cox, Hedberg & Deci, 1996). Findings indicated a positive relationship between the length of time in the doctoral program and student scholarly activity. In other words, as length of time in the doctoral program increased, so did scholarly activity of the students. Additionally, study results suggested that the length of time the student has been in the doctoral program, as

well as their intrinsic and extrinsic goal aspirations and social context, significantly predicted the frequency of scholarly activity. Therefore a student's length of time in a doctoral program, including such factors as social context and goal aspirations may be predictive of a student's scholarly activity. One of the limitations of the research according to Miller (2006), was that the study was ex-post-facto in design and thus inhibited the researcher from attributing causation to the variables. This is related to the current study because an ex-post-facto research design was also employed. Miller's research contributes to the literature as it provided evidence of the fact that length of time in a doctoral program, coupled with social context and intrinsic and extrinsic goal motivations, was predictive of a student's scholarly activity.

Bieschke, Bishop, and Garcia (1996) surveyed 136 doctoral students from the social, physical, and biological sciences at a large mid-eastern university. The students were selected via a convenient sampling method. The researchers administered the Research Self-Efficacy Scale (RSES; Greeley et al., 1989) to measure self-efficacy beliefs of the students and a researcher-created background questionnaire. Outcomes indicated that there was a coherent factor structure of the RSES and that it had the potential to be useful in predicting a participant's interest and involvement in research once he or she becomes a professional. The study illustrated that the RSES may be able to predict interest in research, however, one is not able to say whether the RSES specifically caused the interest in research since the study did not employ an experimental research design. By using the results of this study, one would be able to possibly refine the way in which the current study is conducted since it was found that a coherent factor structure of the RSES may be effective in predicting a participant's interest and involvement in research. Therefore, one would be able to determine which factors had a significant impact on these variables and therefore place more attention on these results. This has implications for the

current study since the researcher may be able to determine whether certain aspects of the RSES have an impact on the research interest. The findings of the study provide insight into the relationship between the RSES and research interest. The following section explores the literature related to the theoretical background of the study.

Theoretical Background

Social Cognitive Theory

Bandura's (1977) definition of self-efficacy, in his social cognitive theory, is one's judgment of his or her ability to implement courses of action to attain certain types of performance. Phillips and Russell (1994) noted that "if people believe that they have the ability to successfully complete a given behavior, then they are more likely to engage in that behavior" (p. 629). If an individual has a high degree of self-efficacy in a particular area, then he or she would approach a difficult task or challenge with the assurance that he or she may overcome any obstacles in his or her path to success (Tang, Addison, LaSure-Bryant, Norman, O'Connell, & Stewart-Sicking, 2004). Therefore, one may conclude that a high level of self-efficacy allows a person to approach obstacles with the knowledge that he or she may overcome any issues that may arise in conducting research.

One variable that has been linked to understanding research interest is research self-efficacy (Bieschke, 2006). Bieschke determined that research self-efficacy beliefs were related to students' interest in research activities. Bishop and Bieschke (1998) noted that research self-efficacy refers to one's beliefs about his or her ability to complete and carry out the steps and tasks associated with the research process. Research supports the notion that self-efficacy mediates outcomes, particularly when it comes to the construct of research self-efficacy (Briggs, 2006; Forester, Khan, & Hesson-McInnis, 2004; Gelso, 2006; Love et al., 2007).

The following section reviews the literature relating to the research training environment theory (Gelso, 1979).

Research Training Environment Theory

In his Research Training Environment Theory (RTE), Gelso (1979) conceptualized the research training environment as “all those forces in graduate training programs (and more broadly, the departments and universities within which the programs are situated) that reflect attitudes toward research and science” (p. 470). Gelso proposed a research training environment model that would allow students to explore their options and gain an interest and understanding in their research endeavors. Gelso posited 10 ingredients of training environments that are designed to encourage and foster students’ interest in research. Royalty, Gelso, Mallinkrodt and Garett (1986) outlined those ingredients as follows:

1. Faculty modeling of appropriate scientific behavior,
2. Reinforcement of student research,
3. Early involvement in research,
4. Untying of statistics and research,
5. Facilitating students' "looking inward" for research ideas,
6. A concept of science as a partly social experience,
7. Teaching that all experiments are flawed and limited,
8. A focus on varied investigative styles,
9. Wedding of science and clinical practice, and
10. Training needs to focus on how research gets done in agencies. (p. 27)

These 10 “rules of thumb” for the research training environment are presented with the intention of affecting the motivation and anxiety levels experienced by the student counseling doctoral students, as well as increasing their interest in and effectiveness with research (Gelso, 1979).

Research supports the relationship between the perceptions of a students’ training environment and interest in research endeavors (Bard, Biescke, Herbert, & Eberz, 2000; Bishop & Bieschke, 1998; Kahn & Miller, 2000; Phillips & Russell, 1994). Khan (2001) asserted that the research training environment, as measured by the RTE, involves students’ research productivity in the following ways: an effective research training environment can work to get a student excited about and invested in research, and research training environments are thought to increase students’ levels of research self-efficacy.

The correlation between research self-efficacy and students’ perceptions of the research environment has been supported in the literature (Kahn & Miller, 2000; Phillips & Russell, 1994; Shivy et al., 2003). Kahn (2001) conducted a national survey of 149 counseling psychology students selected via a random sampling method from 15 APA accredited institutions that tested the Model of Scholarly Activity (Kahn & Scott, 1997). Kahn also integrated mentoring as an element of the RTE and used research outcome expectations as an additional variable. Results indicated an indirect effect of the RTE on scholarly activity through research self-efficacy and research interest.

Jones (2006) determined that mentoring relationships contributed to the research training environment and the enhanced scholarly productivity of pre-tenured faculty members. Jones (2006) found that faculty mentoring predicted satisfaction of doctoral students with their graduate training program. Gelso (1979) noted that faculty mentorship consistently provided an important framework in the RTE. Betz (1997) asserted that based on results in previous

literature, (Kahn & Scott, 1997; Royalty et al., 1996) research mentoring was particularly effective in motivating doctoral students to pursue research. The following section outlines studies pertinent to the interest in research construct.

Interest in Research

Bard and colleagues (2000) posited that Bandura's (1977) social cognitive theory offered an efficacious foundation on which to base the interest in research construct. As described above, Social Cognitive Theory (SCT; Bandura, 1977, 1986) provides a foundation that allows for the understanding and predicting of human behavior. SCT views human behavior through a dynamic lens which includes an interplay of ever-changing factors such as personal, behavior, and environment (Bandura, 1986).

There are two notable studies that examined the interest in research construct. Royalty et al. (1986) surveyed 358 doctoral students based on a convenient sample from 10 APA accredited programs about their research attitudes and interest in research (as measured by a four-item researcher-developed scale) and research training environment (as measured by the Research Training Environment Scale, RTES; Greely et al., 1996). Results indicated that faculty modeling was associated with positive changes in the research attitudes of the participants. Royalty et al. conducted a multivariate analysis of variance (MANOVA) and found that "the difference between the highly impactful programs and the remaining ones is statistically significant on six of the nine scales" (p. 21). The researchers determined that six of the environments on the RTES had a significant impact on the research attitudes of the students. Furthermore, the programs that had the most impact on the students' training environments resulted in positive changes in students' attitudes toward research. The findings indicated that the RTE affected a student's

research attitudes, research productivity and research self-efficacy and the role of the environment on a student's research attitude is influenced by his or her level of training.

Shivy, Worthington, Birtel-Wallis and Hogan (2003) investigated research interest with 35 doctoral students in the Counseling Psychology doctoral program (ranging from first year through All but dissertation [ABD] status) at Virginia Commonwealth University (VCU) in Richmond, Virginia. The measures utilized in this study were the Research Training Environment Scale – Revised (RTES-R; Gelso et al., 1996) and the Self Efficacy in Research Measure (SERM; Phillips & Russell, 1994) in order to ascertain their perceptions of the research training environment and levels of research self-efficacy. Findings indicated that the interpersonal aspects of the RTE environment were ranked to be most important to the students. Additional findings suggested that students scored significantly higher on research design, practical research and quantitative and computer skills subscales, as opposed to writing skills.

Bard and colleagues (2000) examined variables that mediated and contributed to research interest among rehabilitation counseling doctoral students and faculty. Participants included a convenient sample of 184 counseling psychology doctoral students and faculty. Findings suggested that the research training environment had an impact upon the importance that students placed upon their research self-efficacy. Bard and colleagues noted that “faculty modeling may be crucial to developing and fostering students’ research interests” (p. 54). Bard et al. noted that the low participation response (44%), coupled with the specificity of the sample did not allow the results to be generalized to doctoral students and faculty in other disciplines. Findings suggested that there were no differences between the variables in the study. Additionally, the researchers found that research interest was significantly correlated with both research self-efficacy ($r = .28, p < .001$) as well as outcome expectations ($r = .78, p < .001$).

Furthermore, research self-efficacy was significantly correlated with the outcome measures ($r = .33, p < .001$). Findings suggested that the three variables were inter-related. Because of these relationships, one might infer that these variables may be related to one another in future studies. This has implications for the current study as there may be a similar significant relationship between research self-efficacy and research interests of the participants.

In summary, the above detailed the literature pertaining to social cognitive theory, interest in research, and the research training environment theory. The following section provides into the purpose of the current study.

Purpose of Study

The purpose of this study was to examine the relationship between research self-efficacy (as measured by the Research Self-Efficacy Scale – Revised), perceptions of the research training environment (as measured by the Research Training Environment Scale – Revised), and interest in research (as measured by the Interest in Research Questionnaire) of a national sample of doctoral counselor education students. In order to inform and contribute to the counselor education literature and support doctoral student development, it is crucial that counselor education doctoral training programs provide an effective research training environment to foster and encourage student research. The current study addressed the present void in the counselor education literature with regard to counselor education doctoral students' development in the areas of research self-efficacy, perceptions of the research training environment, and interest in research.

Recognizing and appreciating the influence of counselor education doctoral students' research self-efficacy, perceptions of the research training environment, and interest in research may not only be important for students, but is also necessary for counselor education doctoral

preparation programs to continue to develop and prepare students for academic positions.

Doctoral counselor education preparation is designed to prepare students to become practitioners and researchers (Benishek & Chessler, 2005; Gelso & Lent, 2000; Horn et al., 2007). Study findings may provide information to assist colleges and universities to develop and tailor policies to foster research interest and see that it flourishes.

CACREP (2009) provided standards for counselors to ensure they are to be able to perform both research and evaluation effectively. The following guidelines are provided by CACREP with regard to research and program evaluation within the curriculum: (8)

RESEARCH AND PROGRAM EVALUATION - studies that provide an understanding of research methods, statistical analysis, needs assessment, and program evaluation, including all of the following:

- a. the importance of research and opportunities and difficulties in conducting research in the counseling profession,
- b. research methods such as qualitative, quantitative, single-case designs, action research, and outcome-based research;
- c. use of technology and statistical methods in conducting research and program evaluation, assuming basic computer literacy;
- d. principles, models, and applications of needs assessment, program evaluation, and use of findings to effect program modifications;
- e. use of research to improve counseling effectiveness; and
- f. ethical and legal considerations. (CACREP, 2009, p. 12).

Definition of Terms

Doctoral Counselor Education Programs: These programs are designed to train counselor education doctoral students to become scientist-practitioners (teachers, researchers, and supervisors). For the purposes of this study, doctoral counselor education programs are those that are Council for Accreditation of Counseling and Related Educational Programs (CACREP, 2009) accredited.

Doctoral Counselor Education Students: This variable is defined as those students who are enrolled in CACREP (2009) accredited doctoral counselor education programs.

Interest in Research: A person (or persons) that has/have an interest in conducting research and will do it.

Research Self-efficacy: Refers to one's confidence in being able to successfully complete various aspects of the research process.

Research Training Environment (RTE): Gelso (1993), defined the term *research training environment* as “all of those forces in graduate training programs (and more broadly, the departments and universities within which the programs are situated) that reflect attitudes toward research and science” (p. 270).

Scholarly Activities: Though publication in peer-refereed journals is often associated with this term, it is not limited to it. Other scholarly activities include grant writing, speeches, publication in non-refereed journals, books, and presentations. Briggs (2006) highlighted the fact that counselor educators engaged in other scholarly activities as well, including the writing of book reviews, creating training manuals, consultation, supervision and workshops.

Scholarly Research Publications: These include publications in peer-refereed journals (on the international, national, and state levels) and books.

Self-efficacy: This construct is formally defined as “belief in one’s capabilities to organize and execute the courses of action required to manage prospective situations” (Bandura, 1997, p. 2).

Research Questions and Hypotheses

Research Question 1

Is there a statistically significant relationship between research self-efficacy (as measured by The Research Self-efficacy Scale [RSES]), perceptions of the research training environment (as measured by the Research Training Environment Scale – Revised [RTES-R]), and interest in research (as measured by the Interest in Research Questionnaire [IRQ] in counselor education doctoral students?

Research Null Hypothesis 1

There is no statistically significant relationship between research self-efficacy (as measured by The Research Self-efficacy Scale [RSES]), perceptions of the research training environment (as measured by the Research Training Environment Scale – Revised [RTES-R]), and interest in research (as measured by the Interest in Research Questionnaire [IRQ] in counselor education doctoral students?

Research Question 2

Do counselor education doctoral counselor students who have completed their second year, third year (and higher) of preparation demonstrate a statistically significant higher level of research self-efficacy (as measured by The Research Self-efficacy Scale [RSES]) and interest in research (as measured by the Interest in Research Questionnaire [IRQ]) compared to first year, second semester counselor education doctoral students?

Research Null Hypothesis 2

There is no statistically significant difference between scores of research self-efficacy (as measured by The Research Self-efficacy Scale [RSES]) and interest in research (as measured by Interest in Research Questionnaire [IRQ]) between counselor education students who have completed their second year, third year (and higher) of preparation and first year, second semester students.

Research Question 3

Is there a statistically significant relationship between research self-efficacy (as measured by the Research Self-efficacy Scale [RSES]), perceptions of research training environment (as measured by the Research Training Environment Scale – Revised [RTES-R]), interest in research (as measured by Interest in Research Questionnaire [IRQ]) and counselor education doctoral students' demographic variables (i.e., age, gender, education level, scholarly activity, race/ethnicity, location, specialization, doctoral-level research courses taken, and professional aspirations)?

Research Null Hypothesis 3

There is no statistically significant difference between scores of research self-efficacy (as measured by The Research Self-efficacy Scale [RSES]), perceptions of research training environment (as measured by the Research Training Environment Scale – Revised [RTES-R]), interest in research (as measured by Interest in Research Questionnaire [IRQ]) related to counselor education students' demographic variables (i.e., age, gender, education level, scholarly activity, race/ethnicity, location, specialization, doctoral-level research courses taken, and professional aspirations).

Research Design and Data Analysis

A correlational design was used for this research to examine variables as they occurred in their natural state (i.e., without manipulation). The primary purpose of correlational research is to clarify understandings of important phenomena by identifying relationships among variables (Fraenkel & Wallen, 2006), including both the degree and direction of the relationship. Furthermore, a correlational design does not infer causal relationships and is therefore more conducive to purposive sampling (Lambie & Smith, in review). A correlational research design was selected for this study, since the researcher is interested in investigating the relationship between research self-efficacy, perceptions of the research training environment, and interest in research in counselor education doctoral students.

Correlational design is appropriate for the study, since the variables can be operationalized as continuous making it possible to measure the degree and magnitude of the relationship between the variables (Jaccard & Becker, 2002). For the purpose of the study, research self-efficacy was defined as the dependent variable, whereas the research training environment and interest in research were treated as independent variables because the researcher was interested in determining whether the research training environment and interest in research constructs were related to research self-efficacy. Additionally, the researcher explored the potential change in the dependent variable (research self-efficacy) and independent variable (interest in research) in counselor education doctoral students completed two, three and higher (i.e., All but Dissertation Status) of preparation as compared to first year, second semester students. For this reason, an ex-post-facto, cross-sectional research design was implemented in order to determine the differences between these groups. The purpose of the ex-post facto design is to investigate whether one or more preexisting conditions have possibly caused subsequent

differences in groups of subjects (e.g. An ex-post-facto study may explore a research question such as “what are the reasons for high attrition rates of middle school teachers in this county?”) (Nardi, 2003). Further, the researcher was interested in exploring the relationship between counselor education students’ research self-efficacy, perceptions of research training environment, interest in research, and the participants’ demographic data (e.g., age, gender, education level, scholarly activity, race/ethnicity, location, specialization, doctoral level research courses taken, and professional aspirations). The demographic variables in the current study were selected as they were identified to be related to outcome variables (Bard et al., 2000; Kahn & Scott, 1997).

The ex-post-facto, cross-sectional, correlational research design was employed to test the research questions and hypotheses and analyzed by using the Statistical Package for Social Science (SPSS) software package for Windows version 14.0 (2005). The study included the following variables: (a) dependent variable (self-efficacy), (b) independent variables (interest in research and research training environment), and (c) demographic variables.

Johnson (2001) noted that “the purpose of correlational study is to determine relationships between variables” (p.19). Kumar (1999) indicated that correlational research methods allowed the researcher to establish and explore a relationship or association between variables, with the main theme being to ascertain if there was a relationship between said variables. In terms of statistical analysis, the Pearson product moment correlation (r) two-tailed analysis was employed to determine whether the relationship between the variables of research self-efficacy, research training environment, and interest in research were significantly related to one another, while an analysis of variance (ANOVA) was implemented in order to determine if there were relationships between the before-mentioned variables and demographic variables of

the counselor education doctoral students. Pearson's correlation coefficients range between values of -1 and $+1$. If a relationship value of -1 (perfect correlation) is observed between two variables then it would be concluded that there was a strong negative relationship between the variables. On the other hand if there is a value of $+1$ (perfect correlation) observed then this would indicate that there was a strong positive relationship between the variables (Cozby, 2001). The ANOVA was used to determine the amount of variation that was explained in the dependent variable by the independent variables in the model. In other words, the ANOVA determined whether a single or several independent variables had a significant impact on the dependent variable of interest and if this impact was different from zero (Cozby).

The researcher used Likert-type rating instruments (RSES, IRQ, and RTES-R) in the study. One of the most common scaled-response format questions in survey design today is the Likert scale (Dillman, 2007; Nardi, 2003). The Likert scale was developed by American educator and organizational psychologist Rensis Likert (1932) as an attempt to improve the levels of measurement in social research through the use of standardized response categories in survey questionnaires. Jamieson (2004) suggested that scales fall within the ordinal level of statistical measurements. In other words, the response categories in instruments have a rank order, but the intervals between values are not equal (Kumar, 1999). Thus, the categories in the instrument may be assessed by treating them as categorical variables, where each category represents the rank order of the instrument variable.

Population and Data Collection

The participants for this study were counselor education doctoral students in their first year (second semester), second year, third year (and higher) of study. Forty-six CACREP-accredited counselor education doctoral programs were contacted to participate in this study.

Nineteen programs committed to participate. Survey instruments were mailed to the program coordinator (of each program) for distribution to potential participants after approval was received from the Institutional Review Board (IRB) of the University of Central Florida. In order to assure anonymity, no names were collected on the instruments. Based on previous research, the response rates for similar studies were between 50% and 60% (Kahn & Scott, 1997; Mallinkrodt, Royalty, & Gelso, 1990). It would be expected that a similar response rate would be observed for the current study. For this reason, an anticipated number of participants for this study would be 141, which would allow the researcher to adequately address the objectives of the current study.

A cover letter explaining the purpose of the study and a letter of informed consent was enclosed (indicating that returning the packet showed confirmation of informed consent), along with the demographic questionnaire and the following three data collection instruments: (a) Interest in Research Questionnaire (IRQ; Bieschke & Bishop, 1994), (b) Research Training Environment Scale – Revised (RTES-R; Gelso et al., 1996), and (c) Research Self-efficacy Scale (RSES; Greeley et al., 1989). For those programs that chose not to appoint a coordinator to distribute packets, the researcher sent a letter to the contact established at the program, extending an invitation to counselor education doctoral students to participate in the study. Some program contacts chose not to serve as coordinators and in those cases, they agreed to forward my letter of invitation to participate in the study to their counselor education doctoral students via ListServ. The researcher contacted each program and requested the number of doctoral students enrolled in order to be cognizant of the number of packets to begin assembling (141 in total). The following were enclosed in each packet:

- *Interest in Research Questionnaire* (IRQ; Bieschke & Bishop, 1994)

- *Research Training Environment Scale – Revised* (RTES-R; Gelso et al., 1996)
- *Research Self-efficacy Scale* (RSES; Greeley et al., 1989)
- A researcher-developed demographic questionnaire

Included in each data collection packet was a stamped, self-addressed envelope for the packets to be mailed back to the researcher by the counselor education program coordinator or students, as applicable. A one dollar bill was attached to each packet as an incentive for completing the form to support the participants' response rate as per Dillman's (2007) survey research guidelines. In accordance with Dillman's survey research framework, each coordinator received an email before the instruments were mailed to them and an email was sent two weeks after the mailing to follow up. In addition, the researcher sent a hand-written thank you letter to each coordinator expressing the researcher's appreciation for his or her efforts in disseminating the instrumentation packets.

Data Collection Packet Review

The demographic questionnaire along with the instrumentation (RSES, RTES-R and IRQ) and a feedback form was given to the first year, second semester, second and third year doctoral students at the University of Central Florida, in a packet called a *Data Collection Packet Review*. Feedback from these students provided the researcher with insights into the strengths of the questionnaire and the instruments and highlighted areas of improvement.

Instrumentation

There were four data collection instruments administered as a means of capturing the data necessary to test the research questions and hypotheses underlying the study ([a] Demographic Questionnaire, [b] The Research Self-efficacy Scale. [c] Interest in Research Questionnaire, and

[d] Research Training Environment Scale – Revised). The following section offers an introduction to these data collection instruments.

General Demographic Questionnaire

A one-page survey, developed by the researcher, solicited respondents' general information pertaining to age, gender, race/ethnicity, year in program, location, professional aspirations, specialization, number of doctoral-level research courses taken, and professional aspirations (i.e., academia, private practice, etc.), etc. on the questionnaire. This survey was reviewed and revised by a group of counselor education doctoral students and faculty during a pilot study and demonstrated adequate face validity.

The Research Self-efficacy Scale (RSES; Greeley et al., 1989)

This instrument was developed by Greeley et al. (1989) and is a 38 item scale designed to measure an individual's perceived ability to perform various research tasks (i.e., choose methods of data collection, perform experimental procedures, and synthesize results with regard to the current literature). Participants are asked to rate the degree to which they feel confident in their ability to accomplish each item, ranging from 0 (not confident) to 100 (totally confident). Bieschke and colleagues (1995) reported a high internal consistency for the total scale (.96). In addition, Bieschke and colleagues (1996) found evidence of construct validity in their factor analysis of the RSES. Holden et al (1999) determined that RSES had good internal consistency with Chronbach's alphas of .94 at pre-test and post-test respectively.

Other studies support the psychometric soundness of the RSES (e.g., validity and reliability). Kahn, Forester and Hesson-McInnis (2004) performed a factor analysis on the RSES and determined that there was solid construct validity. The study population was comprised of

1,004 counseling psychology graduate students that completed an online survey and respondents comprised of 80% female and 20% male. Results suggested that the standardized first-order factor loadings of the RSES ranged from .48 up to .87 with a median score of .73. As for the second-order standardized factor loadings, they ranged from .75 up to .95, indicating strong relationships between the items in the second factor loading. Unrau and Beck (2004) utilized the RSES in their study on increasing research self-efficacy (among Social Work [$n = 60$] and Speech-Language Pathology graduate students [$n = 75$]) and determined that the RSES had strong internal reliability. The results of this analysis were based on a pre-test, post-test result where it was found that both the social work group and the speech-language pathology students had an increase in their confidence in performing research tasks. The internal consistency for the RSES was determined to have a Cronbach's alpha of .94 for the pre-test and post-test measurements, indicating strong internal consistency for the RSES. In addition, Faghihi (1998) determined that the RSES demonstrated adequate internal reliability consistency (.95) in her research.

Interest in Research Questionnaire (IRQ; Bishop & Bieschke, 1994)

This is a 16 item scale, each of which is a different research activity. Respondents use a scale of 1 (very disinterested) to 5 (very interested) to gauge the degree of interest in a particular research task (i.e., conceptualizing a research study and conducting a literature review). Data on internal consistency resulted in coefficient alphas of .89 (Bishop & Bieschke, 1994) and .90 (Bishop et al., 1995). In both cases the studies of Bishop and Bieschke (1994) and Bishop and colleagues (1995) illustrated that on two separate occasions the internal consistency measure of the IRQ was very high since both were greater or equal to .89. Since the studies were conducted one year apart from one another, this provides more evidence that the IRQ is a consistent

measure because the reliability between the items from one year to the next remained almost the same.

Love and colleagues (2007) determined that the internal consistency, using the IRQ for their study, was evidenced by a Chronbach's alpha of .93. This is similar to the results of Bishop and Bieschke (1994) and Bishop and colleagues (1995) where a relatively high internal consistency measure was observed. Because of this, the IRQ has been shown to be a reliable instrument - meaning that one is able to gather a reliable measure of the desired construct of the students' interest in research. This was further illustrated by Bard and colleagues (2000), where the IRQ demonstrated solid internal reliability and Jones (2006), found that the IRQ had a .94 Cronbach's alpha.

Research Training Environment Scale – Revised (RTES-R, Gelso et al., 1996)

The Research Training Environment Scale—Revised is a 54-item scale with nine subscales. Each subscale was designed to capture a part of the research training environment such as how well faculty members' model appropriate scientific behavior and the level of involvement of students in research activities. There is a 5-point rating scale from 1 (disagree) to 5 (agree). An example of an item is "The faculty members of my graduate program show excitement about research and scholarly activities." Internal consistency over a four week period was indexed, via Pearson's r and found to be roughly .83 (Gelso et al., 1993). Gelso and colleagues (1996) and Kahn (2001) both found discriminant and convergent validity in their respective studies using the RTES-R. Gelso and colleagues (2006) reported test-retest reliability for each subscale ranging from .74 to .94. Both of these studies illustrated that the convergent validity and the test-retest reliability of the RTES-R were satisfied. This indicated that not only do the results of this instrument relate to those of other instruments that measure the same

operational constructs but the measurements are also consistent over time (Fraenkel & Wallen, 2006).

A study conducted by Faghihi (1998) using the RTES-R, revealed an internal reliability consistency of .88. In order to check the reliability of the RTES-R, Faghihi used an item analysis to determine whether the deletion of any items from the instrument would increase its reliability by at least .05 and therefore, it was found that each item contributed to the reliability of the instrument. This indicated that the items on the survey were highly correlated with one another, and measured the same construct. For this reason, the implementation of the RTES-R was appropriate for the current study, since it has been shown to be a valid and reliable tool. Therefore, one would be able to obtain adequate measurements of the construct in order to make correlational inferences between the variables of the study.

Furthermore, Hollingsworth's (2000) research determined evidence of construct validity using the RTES-R. This provided evidence for the use of the RTES-R because the construct validity of the instrument examines the relationships between the scores on the instrument with other criteria (Cozby, 2001). Positive convergent validity was found due to a correlation between the RTES scores, interest in scientific activities and measures of research self-efficacy (Khan & Miller, 2000). This provided evidence that the RTES scores were significantly related to the interest in scientific activities and measures of research self-efficacy scores which are constructs being examined in the current study. Therefore, the RTES-R instrument operationalized the construct as a continuous value that allows one to determine the relationship between that construct and other variables of interest (i.e., interest in research and research self-efficacy).

IRB Considerations

Approval to conduct the study was obtained from the Institutional Review Board (IRB) at the University of Central Florida. All of the data was anonymous during this study. Responses to the survey instruments were anonymous; therefore identifying information was kept anonymous. The researcher, due to the fact that this study contained very minimal risk to participants, anticipated the IRB approval process to be smooth and relatively quick.

Delimitations

The research design, data collection process, and instrumentation may have some limitations in this study. Even though every effort was made to follow the survey research principles created by Dillman (2007), there was the potential for bias due to differences between respondents and non-respondents. It was possible that some students decided to respond based upon their interest in research (negative or positive) and thus self-selected to participate.

Also, the sample chosen may not be generalizable to other doctoral disciplines, especially if they did not adhere to the scientist-practitioner paradigm. In addition, the study was looking at one point in time, whereas results may be more generalizable if this study was longitudinal in nature and followed students during their time in the professoriate as well. Another potential limitation is that the current study does not implement an experimental design. For this reason, the researcher would not be able to make causal inferences towards the target population and the researcher is limited to the associations and possible relationships between the variables of interest.

Another possible limitation, according to Nardi (2003) may be low response rates to survey instruments. Dillman (2007) suggested that follow-up cards, reminders, incentives (such as money) are all ways in which to increase response rates and they were integrated into the

current research study. Furthermore, the survey instruments used in this study may pose potential limitations due to the fact that they have not been widely researched, even though each demonstrated adequate reliability in previous studies.

Summary

This chapter contains the introduction, purpose of study, research questions and hypotheses, and the assumptions and delimitations inherent in this study. Prior research has indicated the need for the training of competent researchers in the field (Belar, 2000; Gelso & Lent, 2000). If programs are able to tailor their curricula and foster mentoring relationships (among other program changes), then it may be possible that more counselor education doctoral students will become excited at the prospect of research, develop solid research competencies, and ultimately further knowledge in the field (Gelso, 2006; Love et al., 2007).

CHAPTER TWO: REVIEW OF THE LITERATURE

Introduction

This chapter reviews the research that has investigated counselor educators and doctoral students levels of research productivity. In addition, the literature on the constructs of the research training environment (RTE), research self-efficacy, and interest in research are explored.

The Importance of Research

Research is comprised of diverse elements, not limited to publication in peer-reviewed journals, which is often given the most prestige in academia (Ramsey, Cavallaro, Kiselica, and Zila, 2002). Boyer (1990) conceptualized the research process as being multidimensional, encompassing elements of discovery, integration, and application. Research also includes presenting at conferences, conducting needs assessments, creating grant proposals, presenting workshops, creating online resources, and writing books (Erwin, 2001; McGrail, Rickard, & Jones, 2006; Shulman, Golden, Bueschel, & Garabedian, 2006).

The scientist-practitioner model (otherwise known as the Boulder model) is the traditional paradigm found in Ph.D. degree programs that seek to combine research and scientific inquiry with clinical work (Benjamin & Baker, 2000). Primary to the scientist-practitioner model is the belief that research is what develops a profession (Belar, 2000). According to the Boulder model, researchers are not expected to evenly divide time and resources between the two mediums of study, but are instead expected to develop a “dynamic understanding and influence” between research and practice (Horn, Troyer, Hall, Mellott, Cote & Marquis, 2007). Central to this study is the expectation that research is of significant importance to the development of the

counseling field as it serves to further the knowledge base (Belar, 2000; Granello & Granello, 1998; Kahn, 2001; Stoltenberg et al., 2000).

Falvey (1991) posited that research in counselor education is critical in order to advance the profession. Increased research productivity by clinicians allows for a higher clinical relevance in the research outcomes and fortifies the scientist-practitioner model (Bowman, 1997; Gelso, 1993). Gelso et al. (1988) discussed the notion that as greater numbers of practitioners conduct research, the quality and efficacy of that research will rise. Reisetter, Korcuska, Yexley, Bonds, Nikels, & McHenry (2004) noted that counselor education programs are often not connected to research, thus an explicit research identity is not created. Magoon and Holland (1984) suggested that encouraging practitioners to research is critical to maintaining separate and distinct fields in the behavioral sciences. In addition, research experience (especially published articles and books) is essential to have in today's academic job marketplace in order to remain competitive for tenure and promotion (Ramsey et al, 2002; Wilson, 2001).

According to the *Ethical Standards for School Counselors* of the American School Counselor Association (ASCA, 2004), an ethical counseling professional must be able to conduct research and share such material in a manner consistent with official education and psychological research standards. Additionally, the American Counseling Association (ACA, 2005) emphasized that ethical counselors must report findings that have value to professionals and their results, even if they portray certain programs, institutions, and opinions to be unfavorable, should be published. Consequently, the ethical considerations of researchers are the foundation of research importance.

The following literature underscores the importance of research for clinical practitioners. Some studies suggested that research was important because it furthered society's knowledge

base or understanding of a certain field. Other studies found that research has the potential to further a profession or help individuals remain competitive within the job market (Golde & Walker, 2006, Horn et al., 2007; Okech et al., 2006). The following section will discuss research productivity in counselor education.

Research Productivity in Counselor Education

The counselor education literature has shown a paucity of research using the constructs of research activity and counselor education doctoral students (Briggs, 2006; Miller, 2006; Reisetter et al, 2004). This lack of robust research activity has been a concern within the counseling field for over two decades (Eisenhart & DeHaan, 2005; Gelso, 2006). Additionally, the literature indicated that the research training of counselor educators and doctoral students is an area of concern (Ramsey et al., 2002). Therefore, research that investigates constructs relating to the research development of counselor education doctoral students is both necessary and timely (Briggs, 2006; Miller, 2006; Ramsey et al., 2002). Due to the lack of literature and published research in counselor education around research activity, the fields of counseling and clinical psychology are included in this literature review.

A notable study conducted by Okech and colleagues (2006) sampled 167 counselor educators drawn from Council for Accreditation of Counseling and Related Educational Programs (CACREP) accredited programs chosen via a systematic random sampling method. The primary focus of the study was to explore counselor educators' views on their research training. A researcher-created, web-based survey instrument was used comprised of demographic questions and sections related to research productivity, doctoral education, the role of mentoring in counselor education, and a section for narrative comments. Findings identified significant variance in the counselor education program graduates as to the utility of their research training.

There was a direct, significant correlation between the respondents' perceptions of their doctoral training and how well it prepared them for research endeavors and the need or interest in further training. In addition, focus was placed on the need for more training in qualitative research in the field. Finally, participants expressed a desire for research-specific mentoring both for counselor education doctoral students and professionals. Another strength of the study was that the sample ($N = 167$) was large enough so that results could be generalized to the counselor education field. However, data was self-reported and thus presented potential reliability issues. Nonetheless, findings suggested that counselor education programs have been more successful recently in promoting research training skills and an appreciation of research, amongst professionals in the field, than in the past.

Ramsey and colleagues (2002) examined scholarly activities of 113 counselor educators over a three-year timeframe. A demographic questionnaire and a scholarly survey (with questions relating to scholarly research activities) were the instruments utilized (created by the researchers). Results suggested that counselor educators tended to pursue activities, such as publishing articles and presenting at conferences, for which they were rewarded by their institutions and seen as favorable in the bid for tenure; rather than focus on other activities such as grant and proposal writing, consulting, and conducting workshops. Findings also indicated that counselor educators used a more inclusive paradigm of scholarship activity (not limited to publishing papers and presenting at conferences) than the committees who decided tenure and promotion requests. A primary strength of the study was that it expanded the limited knowledge in the area of counselor educators' research activities and provided some tentative norms for use as a comparison. In addition, the study was longitudinal in nature and allowed more than a single glimpse into this population. Primary limitations were that there was not an attempt to

triangulate and verify the respondents' information for accuracy and the results of the study may only be generalized to CACREP accredited institutions. Ramsey et al.'s study contributed to the counselor education literature as the authors were the first to look at the scholarly activities of counselor educators in great detail over time.

Another notable work by Royalty and Magoon (1984) investigated the personality and environmental factors that contributed to high and low scholarly activity (high and low producers as they were referred to) among counseling psychologists. The sample consisted of 296 part- and full-time faculty members of national counseling psychology programs who were members of the Council of Counseling Psychology training programs. The purpose of the study was to determine whether faculty with different Holland personality types preferred similar research environments. The data collection instrumentation included: (a) a researcher-developed tool called the Scholarly Productivity Survey (SPS; Magoon & Holland, 1985), and (b) the Vocational Preference Inventory (VPI; Holland, 1985). The findings indicated that the high producers had the following characteristics: (a) obtained a doctoral degree at a young age, (b) felt that his or her education prepared them for the difficulties in getting published, and (c) perceived his or her graduate program to have expectations to participate in research activities. Conversely, the low producers were interested more in the practical applications of research, preferred to spend time in a clinical setting than in research, and enjoyed helping others more than the high producers. In addition, high producers worked best in an environment that allowed them freedom to perform the research that they wanted and allowed them to express themselves creatively.

Royalty and Magoon's (1985) findings supported the application of Holland's (1985) theory of career development in that counseling psychologists with varying personality types flourished in environments that were congruent to their type. For example, researchers with

Investigative interests were more interested in theoretical research than those who had Artistic interests. The study contributes to the counseling psychology literature as it detailed the personal and environmental factors that affect scholarly productivity.

Miller (2006) surveyed a national sample of counselor education doctoral students ($N = 103$) via a convenience sampling method. The research examined the relationship between scholarly activity and both intrinsic and extrinsic goal aspirations. The data collection instruments for the study included: (a) Doctoral Student Scholarly Activity Survey (Miller, 2006), (b) Aspirations Index (AI; Kasser & Ryan, 1996), and (c) Perceived Autonomy Support: The Learning Climate Questionnaire (LCQ; Williams & Deci, 1996). The findings identified a positive, significant relationship between the length of time in the doctoral program and student scholarly activity. Therefore, as length of time in the doctoral program increased, so did scholarly activity of the students. Results suggested that length of time in the in the doctoral program, as well as intrinsic and extrinsic goal aspirations and social context, significantly predicted the frequency of scholarly activity of counselor education doctoral students. The primary limitation was that the researcher suspected that the less motivated doctoral students were not included due to the fact that they may have chosen not to participate. The study contributed to the limited counselor education literature on the topic by providing a beginning sketch with regard to the scholarly activity and goal aspirations of counselor education doctoral students.

Bieschke, Bishop, and Garcia (1996) surveyed 177 doctoral students in counselor education, counseling psychology, and related disciplines enrolled in a large mid-eastern university. The participants were selected via a convenience sampling method. The purpose of the study was to examine research self-efficacy beliefs among doctoral students. The researchers

used the Research Self-Efficacy Scale (RSES; Greeley et al., 1989) to measure self-efficacy beliefs of the students. Findings indicated that there was a coherent factor structure of the RSES, and it had the potential to be useful in predicting a participant's interest and involvement in research once they become a professional. Results suggested that RSES may be able to predict interest in research; however, it was not found whether the RSES specifically caused the interest in research, because the study did not employ an experimental research design.

Kahn (2001) conducted a national survey consisting of 149 counseling psychology students selected via a random sampling method from 15 American Psychological Association (APA) accredited universities that tested the Model of Scholarly Activity devised by Kahn and Scott (1997). Kahn also integrated mentoring as an element of the research training environment (RTE) and used research outcome expectations as an additional variable. Results suggested an indirect effect of the RTE on scholarly activity through research self-efficacy and research interest. The prediction of scholarly activity matched Kahn and Scott's model as it demonstrated that scholarly productivity was directly predicted by year in program, research interest, and research self-efficacy. The addition of the variable of "mentoring" did not have any bearing on the results. Possible limitations were that the findings were based on the students self-report and external validity may have been comprised due to the non-random sample of the participants. The study contributed to the literature as it validated the Kahn and Scott's model and supported the significance of the relationship of the RTE on scholarly activity. The following section will discuss studies that explored the research training environment.

Research Training Environment

This section will review the research that relates to the research training environment (RTE). Subsequently, this section will present the studies relevant to the RTE construct. Gelso's (1979) propositions on the RTE coupled with Lent et al.'s (1994) Social Cognitive Theory Model (SCTM) underscore much of the research on the research training environment in the counseling literature. Gelso outlined two main propositions regarding the RTE and the field of counseling psychology: (a) students entered programs with ambivalent feelings about what it means to be a scholar, and (b) doctoral training programs do not attempt to harness this ambivalence and replace it with a positive view of research. Lent et al.'s SCTM model stressed the fact that the learning environment was a significant variable in career development because it directly influenced self-efficacy beliefs. In addition, the model posited that positive experiences in specific learning environments, especially when they are reinforced, contributed to greater self-efficacy in those areas. Thus, a students' level of research self-efficacy tends to be directly related to his or her learning environment.

Mallinkrodt, Royalty and Gelso (1990) surveyed 358 counseling psychology doctoral students in 10 APA-accredited programs by implementing a stratified random sampling method in order to determine change in research interest as measured by the Research Training Environment Scale (RTES; Royalty, Gelso, Mallinckrodt, & Garrett, 1986), and Vocational Preference Inventory-Form B (VPI-B; Holland, 1978) due to the following variables: Holland personality type, RTE, and environment/personality interactions. The findings indicated that the Investigative personality type and some personality/environment interactions had the most influence on participants' levels of research interest.

Mallinkrodt, Royalty and Gelso (1990) concluded that “person variables (Holland type), training environment variables, and person-environment interactions may all influence changes in research interest” (Mallinkrodt et al., p. 32). Those participants with the Enterprising personality type had lower levels of research interest. Therefore, the researchers found that personality factors had the most influence on interest in research. The primary limitation of the study was that the findings represented correlation and not causality. In summary, the study was significant in that it highlighted the multiple variables that influence doctoral students’ research interests.

Several studies have examined the construct of the RTE and its relationship to doctoral students. Hollingsworth and Fassinger (2002) investigated the role of faculty mentoring in the research training of counseling psychology doctoral students. The researchers surveyed 194 counseling psychology doctoral students (who were in their third and fourth years of study) via a convenience sampling method. The participants were enrolled in counseling psychology programs at one of 25 APA accredited institutions. The results indicated that the research training environment (as measured by a modified version of the RTES-R; Gelso, Mallinckrodt, & Judge, 1996) predicted the students’ experiences with research mentoring (as measured by the Research Mentoring Experience Scale; Hollingsworth & Fassinger, 2002) and their research self-efficacy (as measured by a shortened version of the SERM; Phillips & Russell, 1994). To determine the size of the effect that each of the variables had on one another, correlation coefficients were analyzed. The results indicated that the RTE was positively correlated to the students’ research mentoring experiences ($r = .46$), as well as their research self-efficacy ($r = .34$). Additionally, findings suggested that there was a significant relationship between the RTE and the research productivity of the students ($r = .19$). In each case, the relationship between the

variables was significant (.05 level of significance). Some of the primary limitations of the study included: (a) the fact that the perceptions of past research interests were based on past recollections and were therefore susceptible to bias over time, (b) the data relied on self-reported measurements, and (c) the study used a new and unproven instrument. Nevertheless, the study contributed to the counseling psychology literature as it showed that the RTE predicted research mentoring and research self-efficacy with counseling psychology doctoral students.

Shivy, Kashubeck-West, Biever, Patterson and Welch (2003) investigated research interest with 35 doctoral students in the Counseling Psychology doctoral program (ranging from first year through ABD status) at Virginia Commonwealth University (VCU) in Richmond, Virginia. The measures utilized in this study were the RTES-R (Gelso et al., 1996) and the Self Efficacy in Research Measure (SERM; Phillips & Russell, 1994) in order to ascertain the doctoral students' perceptions of the RTE and levels of research self-efficacy. Results indicated that the interpersonal aspects of the RTE were ranked to be most important to the students. Nine independent sample *t*-tests (two-tailed) were conducted in order to determine whether there were differences between high-impact programs (programs in which the students' attitudes had the greatest positive change towards research) and the VCU student participants (Shivy et al.). Findings suggested that there were no differences between the participants' scores and those who were in the high-impact programs. The study contributed to the literature as it detailed the most important aspects of the RTE with respect to counseling psychology doctoral students.

Brown, Lent, Ryan, and McPartland's (1996) research focused primarily on a re-analysis of Phillips and Russell's (1994) study that examined the relationship between research self-efficacy, the research training environment, and research productivity with 125 counseling psychology graduate students responding to surveys that were distributed to counseling centers at

several universities in which graduate students were employed. The data collection instruments for that study included the RTES (Gelso et al., 1996), the Self Efficacy Research Measure (SERM; Phillips & Russell, 1994), and a researcher-developed demographic and research productivity questionnaire. Betz (1997) suggested that,

The experiences afforded by the training environment (e.g., early exposure to research, faculty role modeling and encouragement, and relevant coursework) not only help to build necessary research competencies but may also foster strong and robust research self-efficacy beliefs which, in turn, lead to greater research productivity. (p. 536)

According to Lent et al. (1994), past experiences from learning contexts affect future attainments partly through beliefs of self-efficacy. Brown and colleagues (1996) noted the relationship between self-efficacy, RTE, and productivity with respect to gender in the Phillips and Russell (1994) study. Findings suggested that self-efficacy beliefs and productivity vary slightly between men and women. Women's self-efficacy beliefs were strongly related to beliefs about RTE, especially in relation to those of men. In addition, the relationship between men's research productivity and self-efficacy was significantly stronger than that of women. The primary limitation of the study was found in the size and diversity of the sample population. These findings provide a significant contribution to the literature with regard to the understanding of the RTE structure as it pertains to self-efficacy, productivity, and gender.

Wang's (2006) qualitative study explored the experiences of 10 female doctoral education students with respect to transformational encounters, feminist consciousness, and activist involvement. The research study's methodology included self-study, observations, face-to-face interviews, e-mail interviews, focus groups, and research journals for gathering data. The

study also employed feminist theories, transformational leadership theory, and critical activism for its theoretical framework.

Wang (2006) determined that qualitative research was a powerful tool. Participants also noted that the use of the qualitative research methodology marked a turning point in the affirmation of their pursuit of a doctoral degree and completion of the research experience. Findings supported that participants considered it important that female doctoral students aim to gain qualitative research skills early on so as to fully develop a theoretical foundation of research. Limitations included a small sample size and possible geographical bias. Such limitations make the results of the study less generalizable. The study is significant as it contributes to limited literature with regard to perceptions of qualitative research and its relationship to female doctoral students.

This section reviewed the research with respect to the RTE. In addition, the studies in this section detailed the factors that affect interest in research with respect to the RTE, the ingredients that foster the RTE, and the relationships between RTE research mentoring and research self-efficacy. The following section will focus on the research self-efficacy construct.

Research Self-efficacy

The concept of self-efficacy is underscored by a person's belief in his or her ability to perform a certain task. Bandura (1977) posited that self-efficacy encompasses more than the ability to execute a task, rather it involves the person's "thought processes, motivation, affective and psychological states" (p. 36). According to Bandura, self-efficacy may be enhanced by the persistence in subjectively difficult activities through experiences of mastery. According to the literature on self-efficacy research, self-efficacy has played an important role in predicting

graduate student interest in conducting research (Bishop & Bieschke, 1998; Kahn & Scott, 1997, Phillips & Russell, 1994

There are several studies that examine the construct of research self-efficacy. Phillips and Russell (1994) investigated the relationship between research self-efficacy (RSE), perceptions of the RTE, and productivity for counseling psychology doctoral students. The findings indicated that there was a positive correlation between RSE, RTE and research productivity. Contrary to the predicted hypothesis, a significant correlation was not found between RSE and research productivity and the participants. The population of the study was comprised of a national sample of 219 doctoral students and interns in counseling psychology. The respondents completed a demographic questionnaire, the SERM (Phillips & Russell) and the RTES (Royalty et al., 1986). A potential limitation was that this study was correlational in nature and thus did not lend itself to making inferences about the casual relationships between the variables. A strength of the study was that the instruments used demonstrated good internal consistency with the SERM having a chronbach's alpha of .96 and the RTES of .92, respectively. The study provided insight into the relationships between RSE, RTE, and research productivity as they related to counseling psychology doctoral students and interns.

Forrester, Kahn and Hesson-McInnis (2004) investigated research self-efficacy and addressed the factor structures of three measures of research self-efficacy using the following: (a) The Research Self-Efficacy Scale (RSES; Greeley et al, 1989), (b) SERM (Phillips & Russell, 1994 and (c) Research Attitudes Measure (RAM; O'Brien, Malone, Schmidt, & Lucas, 1998). The study measured confidence through a number of tasks related to the selection of methodology, data collection, entry, analysis, interpretation, and writing. According to Forrester and colleagues, O'Brien et al's six dimensions of research self-efficacy were "discipline and

intrinsic motivation, analytical skills, preliminary conceptualization skills, writing skills, application of ethics and procedures, and contribution and utilization of resources” (p. 5).

Forrester and colleagues (2004) conducted the study to test the hypothesized factor structures empirically. The study was comprised of 1,004 graduate students in counseling psychology programs nationwide. Each participant completed three measures of self-efficacy via an online survey method. The primary hypothesis was that measures of RSE had the ability to be facilitative in the training and mentoring of graduate students. However, confirmatory factor analysis did not support the factor structures that were hypothesized. The primary limitation was that the study was only generalizable to students studying counseling psychology despite the relatively large sample size.

Mullikin, Bakken, and Betz (2007) investigated research self-efficacy with respect to physician scientists and examined the effects of human agency on the career development of physician researchers. The researchers initially created a 92-item Clinical Research Appraisal Inventory (CRAI; Mulliken, Baken & Betz, 2007), which they later modified to address 88 items. The researchers surveyed a national sample of 210 physicians within academic medicine and found that the CRAI reliably measured eight dimensions of research self-efficacy. Limitations of the study included a small sample size and an inability to attract diversity within the sample population. This was the first study to address research self-efficacy in the clinical research domain using a population of academic physicians and thus provides significant insight into the relationship between research self-efficacy and career development with regard to physician scientists.

Unrau and Beck (2004) explored the relationship between research self-efficacy and course enrollment in graduate programs. The sample included 60 social work and 75 speech-

language pathology students. In order to determine how course enrollment affected research self-efficacy, the study evaluated gains in research self-efficacy between students enrolled in both research and practice courses as well as those only enrolled in practice courses. The motivation behind the survey was to understand the perceived lack of emphasis on research training with social work and speech-language pathology students (Lecroy & Goodwin, 1988). The study used RSE scores to evaluate self-efficacy gains. The results indicated that students the majority of students experienced gains in confidence. Students enrolled in both the research and practice classes showed the most significant gains and when research was aligned with learning opportunities outside of the classroom, self-efficacy gains were the greatest. The speech-language pathology students improved roughly 30 points on the total RSE score over 16 weeks, compared with the next largest increase of roughly 18 points. Limitations of the study included several known threats to internal validity, namely history, maturation, regression, and differential selection effects. Nevertheless, the study contributed to the limited literature regarding the relationship between research self-efficacy and class enrollment.

Geisler's (1995) study examined the relationship between research self-efficacy and counseling psychology students' dissertation progress. The instrumentation included: (a) Scientist-Practitioner Inventory for Psychology (SPI; Leong & Zachar, 1991), (b) Research Training Environment Scale (RTES, Royalty et al, 1986), (c) Self-Efficacy Measure (SERM; Phillips and Russell, 1994), and (d) Demographic and Research Questionnaire (Geisler, 1995). The sample comprised of 331 counseling psychology doctoral students randomly selected from 24 APA approved programs. Findings suggested that research self-efficacy was positively correlated to dissertation progress with perceptions of the research-training environment not a significant factor. Additional results indicated that scientific interest and research self-efficacy

were positively related, and that research self-efficacy was the most influential predictor of dissertation progress.

There were several limitations inherent in the study. There was no way to determine the differences between perceptions of students who had responded and those who had not. The study measured the students' perception of their environment, not the environment itself, and did not take into account faculty perceptions of the training environment. Because the study was based on self-reporting, there was potential for biased responses. The overall response rate was 30%, which is below average (Dillman, 2007). Additionally, the study was limited to APA approved counseling psychology doctoral students and therefore generalizability of results may not be possible. In summary, the study contributed to the counseling psychology literature as it provided insight into the relationship between self-efficacy and doctoral students' dissertation progress.

Faghihi (1998) examined the effects of mentoring on dissertation progress of 97 doctoral students at the University of Memphis, representing the disciplines of counseling, educational psychology, research and curriculum instruction, and leadership. Instrumentation included a researcher-developed 61-item dissertation questionnaire. The results suggested that the role of faculty advisors and committee members was significant in the students' progress toward dissertation completion. Students who indicated that they had positive and cooperative relationships with advisors and committee members were more advanced in the writing of their dissertation than others. Faghihi concluded that research efficacy was a function of a positive and nurturing research environment as well as a strong supervisory system.

There were some limitations to Faghihi's (1998) study. The sample consisted of doctoral candidates at the College of Education at The University of Memphis, which limited the

generalizability. The independent variables could not be manipulated and therefore causation could not be inferred. Using a self-report questionnaire could have resulted in response bias. In addition, the instrument utilized did not have a demonstrated track record of reliability and validity in the literature. The study contributed to the literature because it examined students' dissertation progress in relation to RTE, involvement in research, research training/preparation, graduate assistantships, student-advisor relationships, and research self-efficacy.

Tang and colleagues (2004) examined the relationship between counselor education graduate students self-efficacy with regard to counseling skills. One hundred and sixteen participants were recruited from six counselor education programs located in the Midwestern region of the United States. Three of the six programs were CACREP-accredited. To gather demographic information, a researcher-developed questionnaire was created that included items such as: age, gender, race, years of human services work experience, hours of clinical instruction, number of clinical courses taken, and student enrollment status (part- or full-time). Self-efficacy was measured using the Self-Efficacy Inventory (S-EI; Friedlander & Snyder, 1983). The S-EI measured self-efficacy in counseling and rated participants' ability to perform tasks in five domains: academics, assessment, individual counseling, group and family intervention, and case management.

Tang et al. (2004) found that the total scores of self-efficacy between graduate students from CACREP and non-CACREP-accredited programs did not differ. The lack of differences between the two groups occurred when controlling for amount of course work, hours of internship, and prior work experience. There were differences found between the two groups in that students from CACREP-accredited programs had higher levels of self-efficacy in counseling anxiety reactions, assessment using clinical interviews, counseling adjustment reactions, and

counseling affective disorders. Limitations of the study included the regional geographic sample and the fact that information about training and internship hours was self-reported. The findings are a significant contribution to counselor education literature as results suggested that the main source of variation in student self-evaluation with regard to counseling skills was the number of training hours and the amount of previous relevant work experience they had. This study supports Bandura's (1986) theory of self-efficacy, which asserts that past experiences and real-world involvement in related tasks assist students in developing more confidence in accomplishing tasks.

This section discussed the relevant literature with respect to research self-efficacy. In addition, the literature examined research self-efficacy as it related to the RTE, worker productivity, the factor structure of the three measurements of research self-efficacy, the factors of research self-efficacy, and the relationship between research self-efficacy and course enrollment. These studies provided a necessary foundation for understanding research self-efficacy as it is related to the purpose of this study. The next section will discuss interest in research.

Interest in Research

This section will discuss the literature related to interest in research construct. Before reviewing the relevant studies, this section will look at research interest as it relates to Lent et al.'s (1994) social cognitive model of interest development. According to Lent et al., interest in research is a function of personal inputs, environmental inputs, research self-efficacy, and research outcome expectations. Personal inputs (including investigative interests, artistic interests, social interests, gender, and age) affect interest in research directly and indirectly

through research self-efficacy, research outcome expectations, and environmental influences. Environmental influences included RTE and a student's year in a program.

Webb (2004) sought to explore why students chose to enroll in Ph.D., Psy.D., and Master's level training programs in counseling and psychology. Webb specifically looked at the individual differences between these three types of students with respect to vocational interests. The sample included 16 (Ph.D.) students in counseling psychology, 15 doctoral (Psy.D.) students in clinical psychology, and 42 Masters of Arts in Counseling (MAC) students, totaling 73 students. Vocational interest was measured with Holland's Self-Directed Search (SDS; Holland, 1994), containing 228 items arranged in four sections: occupations, activities, competencies, and self-estimates. There was an additional researcher-developed questionnaire (Program Preference Assessment) designed to measure how degree choice related to therapy/counseling and/or research emphasis. The two hypotheses were not supported by the data. The first hypothesis stated that students chose degree programs based on individual differences in vocational interest. The second hypothesis indicated that students selected program emphasis based on vocational personality. The findings may be due in part to the fact that students scored high in the social and vocational portions of the SDS. Results suggested that doctoral students were more aware of their research programs' emphasis training model than Master's students, though Webb indicated that these results may be flawed due to the fact that the study was not longitudinal in nature. The study advances the understanding of the relationship between research interest and vocational goals with both doctoral students and masters students in counseling and clinical psychology.

Reisetter and colleagues (2004) conducted a phenomenological study that investigated counselor educators' experiences of qualitative research. The sample was comprised of 6 counselor education doctoral students in a small Midwestern university who were exposed to

qualitative research methods. A phenomenological research method was employed, which utilized interviews, reflective journals, and focus groups. Findings suggested that five of the six doctoral students had positive experiences with qualitative research. The researchers recognized several themes throughout the course of the study, which included perceived worldview congruence, perceived counseling theory and skills congruence, perceived research identity and professional viability, and the holistic nature of perceptions and experiences (Reisetter et al.).

Limitations of Reisetter et al.'s (2004) study included the fact that the students had only participated in one qualitative research course and lacked long-term perspective. In addition, the study had a very small sample size ($N = 6$) who may have had regional or geographical biases. The generalizability of the study is therefore in question. The study is significant in that it suggests that there is a theoretical affinity between qualitative research and counselor perspectives and practice. In addition, it contributes to the limited literature examining the relationships between interest in research, qualitative research, and counselor education doctoral students. The following section reviews the construct of the research training environment.

Research Training Environment

This section discusses the literature and research surrounding solutions to solving the issue of preparing doctoral students to become proficient researchers (Golden & Dore, 2001, Shulman et al., 2006). The Carnegie Foundation for the Advancement of Teaching (2008) is a significant supporter and contributor to the advancement of the literature addressing research training. The Carnegie Foundation is an independent policy and research center with a primary mission to perform all things necessary to encourage, uphold, and dignify the profession of the teacher and the cause of higher education (Nyquist, 2002). The Carnegie Foundation for the Advancement of Teaching introduced the Pew National Fellowship Program for Carnegie

Scholars, now known as the Carnegie Scholars Program, in an effort to bring together scholars and educators to create a community of people who introduce, develop, and share understandings of teaching (Shulman et al., 2006).

Golden, Bueschel, Jones, and Walker's (2008) literature review noted that doctoral comprised a series of milestones and requirements. The combination of informal expectations (namely teaching assistant obligations), conference presentations, lab meetings, and formal requirements (dissertations and final examinations) sought to allow students to develop their skills, knowledge, and "habits of mind" (p. 2). The authors' additional goal was to define the purpose of the doctoral program and to determine whether doctoral programs currently meet their intended goals. Golden and colleagues noted that a failure of graduate education was the cause of many students' disillusionment and lack of passion for research. Golden et al. also noted that this loss had to do with levels of transparency within student-professor relationships and unrealistic expectations regarding student research. The review identified two key solutions to the problems facing doctoral study: (a) reclaiming visions of apprenticeship and (b) the forming of a cohesive intellectual community.

Nyquist's (2002) literature review focused on the usefulness and success of the doctoral degree and the necessary ingredients for change. Nyquist stated, "The Ph.D. was not 'done wrong'; in fact, it has been done magnificently. But changes in society create new requirements, and we need to honestly assess the efficacy of the Ph.D. now" (p. 13). Nyquist's critique focused on the stakeholders, which she identified as those who aspire, prepare, fund and hire Ph.D.s, and those who influence doctoral education (see Table 1). Nyquist posited that the future of the Ph.D. process depended upon the level of courage among stakeholders to work together and create a synergy to propel the degree forward. The relationships of stakeholders in the Ph.D. process are

similar to a tapestry with many different strands contributing in their own way to the completion of the project (Nyquist).

Table 1. *Contribution of Stakeholders*

Stakeholder Groups or Sectors	Members	Goals	Contributions to Re-envisioning Doctoral Education	Issues to Navigate
-Those who aspire to the Ph.D.s	-Doctoral students and potential doctoral students	-Achieving a fulfilling professional life	-Aspirations, talents, knowledge, minds, feedback on processes that enhance learning, fulfill aspirations	-Opportunity costs, time to first professional appointment, family responsibilities, and creative opportunities
-Those who prepare Ph.D.s	-Research institutions	-Preparing next generation of deeply trained humanists, and social and physical scientists. -Producing the nation's research	-Recruitment of students, design of educational experiences, mentoring, setting of standards for conferral of degree, and providing transparent expectations for success	-Inflexible structures, institutional traditions, Carnegie Classifications, NRC Ratings, faculty reward structure, funding policies, and lack of experience outside the academy
-Those who fund Ph.D.s	-Government agencies, business and agencies, foundations, and universities	-Producing the nation's workforce and research -Producing outcomes of particular interest to particular funding agencies	-New funding models and redirection of dollars for new goals	-Research Institution culture, recommendations of peer review panels, concern about creative and innovative future workforce, and trends in funding
-Those who hire Ph.D.s	-Research initiative institutions, teaching-intensive institutions, Government nonprofit	-Teaching, research, and service in proportions appropriate to academic sector. -Critical and	-New contexts for teaching, extended audiences for research, explication of societal needs, new career	-Carnegie Classifications, non-departmental interdisciplinary institutional structures, differential

Stakeholder Groups or Sectors	Members	Goals	Contributions to Re-envisioning Doctoral Education	Issues to Navigate
	organizations, and business and industry	analytical thinking, creative ideas, intelligence, and leadership for all sectors	options, and explication of expectations of employees	leadership responsibilities, intellectual property issues, and corporate/ nonprofit/ government needs
-Those who influence Ph.D. education	-Professional societies, educational associations, national rankings, accreditation associations, and governance boards	-Setting agenda for what is valued, measuring what is valued, and approving what will be offered at doctoral level	-Improving standards to meet new needs, collaborating within sectors, and maintaining conversations about doctoral education	-Valorization of research, disciplinary customs, dependence on national rankings, and prestige of research faculty

Note: Adapted from Nyquist (2002)

Shulman et al. (2006) performed a literature reviewed, on behalf of the Carnegie Foundation, to examine the conflicting purposes of the doctoral process preparing both scholars and practitioners. They believe that the attempt to focus on both fronts results in neither scholars nor practitioners being well prepared. The authors proposed that, as the two roles are intertwined, the improvement of one will lead to an improvement in the other. As such, positive change should be implemented locally, university by university, with a network of institutions offering support for ideas of reform.

Golde and Dore (2001) examined perceptions of the doctoral experience by doctoral students. They created a survey called Doctoral Education and Career Preparation, which asked questions such as: (a) why doctoral students pursued their degree, (b) how effective they perceived the programs to be, and (c) expectations for their program. The sample consisted of 4,114 students from 27 different universities representing 11 disciplines within the arts and

sciences and 1 cross-institutional program, the Compact for Faculty Diversity. The results suggested that most students were not satisfied with the training that they received as they indicated that it did not prepare them for the jobs that they desired. The majority of respondents did not understand what doctoral studies entailed, how the process worked, and what the expectations placed on students by their programs were. Furthermore, the results suggested that there was a significant mismatch between the purpose of doctoral education, the aspirations of doctoral students, and the realities of their intended careers. The findings of this study were relevant to the current study as it provided valuable insight (especially given the large sample size) into student perceptions' of their research training environment.

Dahl, Laeng, and Silvera's (2003) reviewed the informal and formal training environments of clinical psychology doctoral students in the United States (U.S.). The authors employed their first-hand experiences as doctoral students to highlight milestones in completing the doctoral program. Dahl and colleagues outlined the important goals for a doctoral student, including gaining theoretical knowledge related to the field of study, gaining theoretical knowledge related to methodology and statistics, learning teaching skills, and gaining practical knowledge in research design and statistics. The authors agreed that U.S. clinical psychology doctoral programs provided effective training in both theoretical knowledge related both to the field and to research methodology.

Dahl and colleagues (2003) also noted that doctoral students did not always gain knowledge of teaching because some graduated without teaching a college-level course and that some programs did not focus on teaching skills. In terms of gaining practical knowledge in research design and statistics, the authors posited that a faculty research mentor was essential in this endeavor. Dahl and colleagues indicated that a research mentor could assist students in

understanding the mechanics of research design, yet it did not mean that a student could then perform research independently as a result of such mentoring.

Dahl et al. (2003) also touched upon some problems doctoral students experienced. They pointed to the fact there were more doctoral students than there were jobs in academia, and the fact that there was often little to no preparation for jobs outside of that sector. Another issue facing students was that many spent more than five years completing their degree because of the fact that they had poor economic support from their home institutions. In summary, this article provided important and timely insights into the expectations and realities of clinical psychology doctoral training in the U.S.

Hollingsworth (2000) investigated the role of student-faculty mentoring relationships with respect to the research training of counseling psychology doctoral students. The population was comprised of 194 counseling psychology doctoral students enrolled in 25 nationwide APA accredited programs, who were surveyed about their interest in research and mentoring, RTE, past and current research, and mentorship relationships with faculty. The instrumentation included: (a) Interest in Being Mentored Scale (Hollingsworth, 2000), (b) Research Training Environment Scale – Revised (RTES-R; Gelso et al., 1996), (c) Attitudes Towards Research Measure (Royalty et al., 1986), (d) Mentoring Satisfaction Scale (Cronan-Hillix et al., 1986), (e) a brief version of the Self Efficacy in Research Measure (SERM; Phillips & Russell, 1994), and (f) a researcher-developed demographic questionnaire. The researcher's goal was to determine if mentoring relationships had a significant effect on student research behaviors and attitudes controlling for the influences of the RTE.

Hollingsworth's (2000) findings supported that student attitudes and perceptions of mentoring and RTEs were reliable predictors of mentoring relationships. Past research attitudes

also predicted current research attitudes and behaviors. Hollingsworth (2000) found that the RTE indirectly affected current research attitudes and predicted roughly 60% of faculty mentoring. The primary limitations of the study included the fact that the results were not generalizable to students in disciplines other than counseling psychology, the reliance upon self-reported data, the non-longitudinal nature of the research, and the use of instrumentation that did not have a track record of reliability in the literature. Despite these limitations, the study made a significant contribution to the literature as it provided a detailed understanding of the relationship between mentorship and students' research attitudes and behaviors.

Jones (2006) examined the influence of mentoring on research productivity (as measured by using a 12-item version of the SERM; Phillips & Russell, 1994), research self-efficacy (as measured by RSES-R; Greely et al., 1989), and satisfaction with graduate training program (as measured by Graduate Student Satisfaction Questionnaire; GSSQ; Field & Giles, 1980) of 142 counseling psychology doctoral (in their second year or later of study) students drawn from 50 APA approved programs. Students were selected based on a convenience sampling method in which online surveys were sent to counseling psychology program coordinators who then distributed the online link to students in their respective programs.

Jones's (2006) results indicated that 54.5% ($n = 77$) of the sample reported having faculty mentorship and 30.6% ($n = 43$) indicated that they had both a faculty and research mentor. Jones' (2006) hypothesis was supported in that effective research mentoring was a predictor of counseling psychology students' satisfaction with their training program. It was also found that, based on independent sample *t*-tests, there were no significant differences between the gender of the participants in terms of research self-efficacy, research productivity, and interest in research. Similarly, one-way ANOVAs revealed that no significant difference existed in the number of

years in the program when looking at the satisfaction with graduate program, self-efficacy, interest in research, research productivity, and life satisfaction scores.

Griffin, Hill, and McMinn (2004) explored the attitudes of doctoral students, faculty, and alumni toward their training programs at seven Christian-oriented clinical psychology training programs nationwide. The population was comprised of 283 students, 98 alumni and 51 faculty members ($N = 432$). A researcher-developed survey was created to gauge the participants' satisfaction with their research training. Results indicated student and faculty collaboration were important factors in the satisfaction with the participants' training programs both in terms of mentoring from a research and a Christian perspective. Griffin and colleagues believed that if the students had wanted "state-of-the-art research involvement" (p. 4), they would have pursued admission or employment at a major research university instead. Because the study focused on doctoral students in Christian programs, the results may not be generalizable to programs that are not faith-based.

Love, Bahner, Jones and Nilsson (2007) surveyed 131 counseling psychology doctoral students in APA accredited counseling psychology programs to examine the influence of early research experience on research self-efficacy. Instrumentation included (a) a researcher-developed demographic questionnaire (b) Interest in Research Questionnaire (IRQ; Phillips & Russell, 1994), and (c) Research Self Efficacy Scale (RSES; Greeley et al., 1989). Results suggested that participants reported to have had the most positive responses with regard to research team experiences. Common satisfactory themes were effective group dynamics, support from a faculty member/advisor, autonomy in developing one's own interests and ideas, learning more about the process of conducting research, and liking the research topic. The most common

unsatisfactory themes were problems with group dynamics, lack of support from advisor, slow progress, and disorganization.

Love and colleagues (2007) found that faculty support and mentoring were the most important contributors to satisfactory individual research experiences. For team research, it appeared that the faculty members' ability to effectively manage research teams and facilitate cooperative dynamics within the team, were the main components of student satisfaction.

Limitations included the fact that students self-selected to participate and that generalizability to other fields was limited. The study contributed to the literature as it highlighted the importance of early research mentoring and training for doctoral students.

Summary

This chapter examined the research and literature regarding research productivity of counseling professionals and doctoral students. It discussed the importance of research and its effect upon counseling professionals' and doctoral students' levels of research productivity. In addition, the chapter explored the research addressing the constructs of the RTE, research self-efficacy, and interest in research. The following chapter will discuss the methodology of this study, providing an understanding of the structure and the conduct of the study.

CHAPTER THREE: METHODOLOGY

This chapter presents the methodology used in this study and details the research design, research questions and hypotheses, target population and sampling plan, the instrumentation, data collection procedures, and statistical analysis procedures. This study was reviewed by the University of Central Florida's Institutional Review Board to ensure that all data collection procedures conformed to legal and ethical standards.

Overview

This research study examined the relationships between research self-efficacy, perceptions of the research training environment, and interest in research with a national sample of counselor education doctoral students ($N = 89$). Research self-efficacy was measured by the Research Self-Efficacy Scale – Revised (RSES; Greeley et al., 1989), while the perceptions of the research training environment and interest in research variables were measured by the Research Training Environment Scale – Revised (RTES-R; Gelso et al., 1996) and Interest in Research Questionnaire (IRQ, Bieschke & Bishop, 1994), respectively. Additionally, the study investigated whether there were differences between research self-efficacy, perceptions of the research training environment, and interest in research in relation to the demographic characteristics of counselor education doctoral students. To examine these differences, research self-efficacy, perceptions of the research training environment, and interest were treated as dependent variables whereas the demographic characteristics were operationalized as independent variables. The demographic characteristics included: gender, race/ethnicity, year in program, age, years of post-graduate experience, scholarly activity, specialization, doctoral-level research courses taken, location of program, and professional aspirations. A quantitative,

descriptive research design was implemented that included Pearson's correlation coefficients as well as an analysis of variance (ANOVA).

Research Design

The research design implemented in this study was an ex-post-facto, cross-sectional correlational design. This type of design was used so that the researcher could examine variables as they occurred in their natural state (i.e., without manipulation). The primary purpose of correlational research is to clarify understanding of important phenomena by identifying relationships among variables (Fraenkel & Wallen, 2006), including both the degree and direction of the relationship. Furthermore, a correlational design does not infer causal relationships and is therefore more conducive to purposive sampling. (Lambie & Smith, in review). A correlational research design was selected for this study, since the purpose of this study was to determine if there is a relationship between the research self-efficacy, research training environment and research interest in doctoral counselor education students. This type of design was an appropriate choice because the variables of interest were operationalized as continuous variables, which made it possible to measure the degree and magnitude of the relationship between them. For the purpose of this study, research self-efficacy was defined as the dependent variable, whereas research training environment and interest in research were treated as independent variables.

Additionally, this researcher explored the potential change in the research self-efficacy and interest in research variables for counselor education doctoral students who had completed two, three (and higher) years of preparation as compared to first year, second semester students. For this reason, an ex-post-facto research, cross-sectional design was employed to determine differences between these groups with respect to the research self-efficacy and interest in

research variables. The purpose of ex-post-facto research is to describe research where individuals are not formed into groups randomly, but are placed in groups based on an observed difference (i.e., level of education) (Mertler & Charles, 2008). Research self-efficacy and interest in research were treated as the dependent variables whereas the level of education was the independent variable.

Further, this researcher was interested in exploring the relationship between doctoral counselor education students' research self-efficacy, perceptions of the research training environment, interest in research and the participants' demographic data (gender, race/ethnicity, year in program, age, years of post-graduate experience, scholarly activity, specialization, doctoral-level research courses taken, location of program, and professional aspirations). These demographic variables have been selected since they have been shown to be related to outcome variables of interest (Bard, 2000; Kahn & Scott, 1997). For this part of the study, research self-efficacy, perceptions of research training environment, and interest in research were operationalized as dependent variables while the demographic characteristics were treated as independent variables.

An ex-post-facto, cross-sectional, correlational research design was used to examine the research questions and hypotheses and was analyzed using the Statistical Package for Social Science (SPSS) software package for Windows version 14.0 (2005). The study included the following variables: (a) dependent variable (research self-efficacy; Bishop & Bieschke, 1994) and (b) independent variables (interest in research; Greeley et al., 1989 and research training environment; Gelso et al., 1996). Included in the analysis were the demographic characteristics reported by students that participated in the study (gender, race/ethnicity, year in program, age, years of post-graduate experience, scholarly activity, specialization, doctoral-level research

courses taken, location of program, and professional aspirations). In terms of statistical analysis, the Pearson product moment correlation (r) (two-tailed) was employed to determine the relationship between the variables of research self-efficacy, research training environment, and interest in research, while an analysis of variance (ANOVA) was implemented to discern if there were statistically significant differences between the before-mentioned variables and the level of education of the doctoral student as well as the demographic characteristics of gender, race/ethnicity, year in program, age, years of post-graduate experience, scholarly activity, specialization, doctoral-level research courses taken, location of program, and professional aspirations. Pearson's correlation coefficients range between values of -1.0 and $+1.0$ (perfect correlation). If a relationship value of -1.0 is observed between two variables then it would be concluded that there is a perfect negative relationship between the variables. On the other hand, if there is a value of $+1.0$ (perfect correlation) observed then this would indicate that there was a perfect positive relationship between the variables. The ANOVA was then used to determine the amount of variation that was explained in the dependent variable by the independent variables in the model (Moore & McCabe, 2006). In other words, the ANOVA determined whether a single or several independent variables had a significant impact on the dependent variable of interest and if this impact is different from zero.

Research Questions and Hypotheses

In order to address the objectives of this study, several research questions were posed. These research questions were designed so that the researcher had the ability to assess the objectives of the study, as well as to place focus on the results that were obtained throughout the study process. Similarly, null hypotheses were posited so that the researcher was able to address

the research questions using statistical procedures. For this reason, three primary research questions and research null hypotheses were explored in this study:

Research Question 1

Is there a statistically significant relationship between research self-efficacy (as measured by The Research Self-efficacy Scale [RSES]), perceptions of the research training environment (as measured by the Research Training Environment Scale – Revised [RTES-R]), and interest in research (as measured by the Interest in Research Questionnaire [IRQ]) in counselor education doctoral students?

Research Null Hypothesis 1

There is no there a statistically significant relationship between research self-efficacy (as measured by The Research Self-efficacy Scale [RSES]), perceptions of the research training environment (as measured by the Research Training Environment Scale – Revised [RTES-R]), and interest in research (as measured by the Interest in Research Questionnaire [IRQ]) in counselor education doctoral students?

Research Question 2

Do counselor education doctoral counselor students who have completed their second year, third year (and higher) of doctoral preparation demonstrate a statistically significant higher level of research self-efficacy (as measured by The Research Self-efficacy Scale [RSES]) and interest in research (as measured by the Interest in Research Questionnaire [IRQ]) compared to first year, second semester counselor education doctoral students?

Research Null Hypothesis 2

There is no statistically significant difference between scores of research self-efficacy (as measured by The Research Self-efficacy Scale [RSES]) and interest in research (as measured by Interest in Research Questionnaire [IRQ]) between counselor education students who have completed their second year, third year (and higher) of preparation and first year, second semester students.

Research Question 3

Is there a statistically significant relationship between research self-efficacy (as measured by the Research Self-efficacy Scale [RSES]), perceptions of research training environment (as measured by the Research Training Environment Scale – Revised [RTES-R]), interest in research (as measured by Interest in Research Questionnaire [IRQ]) and counselor education doctoral students' demographic variables (gender, race/ethnicity, year in program, age, years of post-graduate experience, scholarly activity, specialization, doctoral-level research courses taken, location of program, and professional aspirations).

Research Null Hypothesis 3

There is no statistically significant difference between scores of research self-efficacy (as measured by The Research Self-efficacy Scale [RSES]), perceptions of research training environment (as measured by the Research Training Environment Scale – Revised [RTES-R]), interest in research (as measured by Interest in Research Questionnaire [IRQ]) related to counselor education students' demographic variables (gender, race/ethnicity, year in program, age, years of post-graduate experience, scholarly activity, specialization, doctoral-level research courses taken, location of program, and professional aspirations).

Population and Sampling Plan

The target population for this study was comprised of counselor education doctoral students enrolled in CACREP accredited programs nationwide. In order to obtain information on the intended target population, the participants were counselor education doctoral students who were in their first semester, second semester; second year, third year (and higher) of preparation. All 46 CACREP-accredited counselor education doctoral programs were contacted to participate in this study with nineteen programs committed to participate. Survey instruments containing the data collection instruments (141) were mailed to the program coordinator (of each program) for distribution to each potential participant once approval was received from the Institutional Review Board (IRB) of the University of Central Florida. Some programs chose not to have a coordinator and the researcher sent out a letter (via listserv) to students requesting participation in the study. A purposive sampling plan was implemented in this study. This type of sampling plan is appropriate for this study as it allowed the researcher to obtain a larger sample size and more information in a shorter period of time (Cozby, 2001).

Based on previous research, the response rates for similar studies result in response rates of around 50% to 60% (Kahn & Scott, 1997; Mallinkrodt, Royalty, & Gelso, 1990). It would be expected that similar response rates would be observed for this current study. For this reason, an anticipated number of participants for this study were estimated. In order to make conclusions based on the data collected, the researcher would require an adequate number of participants. In determining the appropriate sample size for the study, there were several factors that had to be taken into consideration. These factors include the power of the study, the effect size of the study and the level of significance. The power of the study is a measurement of the probability of rejecting a false null hypothesis (Moore & McCabe, 2006). In other words, this is a measurement

of the probability of not making Type II errors where one fails to reject the null hypothesis when in fact the null hypothesis was false or the alternative was true. As a general rule of thumb, the minimum power of a study that would be necessary to correctly reject a false null hypothesis would be equal to 80% (Keuhl, 2000). The next factor of importance was the size of the effect, which is a measurement of the strength or magnitude of the relationship between the independent and dependent variables in the analysis (Cohen, 1988). In most cases effect size may be defined in terms of a small, medium or large effect. Finally the level of significance is important as well. This is almost always set at the alpha level of .05. Finally, the confidence interval is another factor to take into account.

The sample size would also depend on the type of analysis that is being conducted as well. For the purpose of this study the type of analysis that was used was that of an ANOVA. In terms of the ANOVA, the sample size also depends on the number of groups that are being compared (e.g., first year students and non-first year students). Based on this information, the minimum sample size that would be required for this study would be 68. This was based on a power of 80%, a level of significance of 5% and an effect size equal to $f = 0.35$. In order to make sure the minimum sample size was obtained 141 survey instruments were distributed to the potential participants.

Instrumentation

There were four data collection instruments administered as a means of collecting the data necessary to examine the research questions and hypotheses underlying this study. These four instruments included: (a) Demographic Questionnaire, (b) The Research Self-efficacy Scale, (c) Interest in Research Questionnaire, and (d) Research Training Environment Scale – Revised. The following section provides an introduction and critique on these data collection instruments.

General Demographic Questionnaire

A one-page survey, developed by the researcher, solicited respondents' general information pertaining to gender, race/ethnicity, year in program, age, years of post-graduate experience, scholarly activity, specialization, doctoral-level research courses taken, location of program, and professional aspirations (i.e., academia, private practice, etc.). The questionnaire was distributed with the other three instruments in this study to the counselor education program doctoral students. The demographic questionnaire along, with the instrumentation (RSES, RTE and IRQ), and a feedback form, was given to 20 counselor education doctoral students (first, second and third year) at the University of Central Florida, in a packet called a *Data Collection Packet Review*. In addition, the packet was also reviewed by the researcher's dissertation committee. Feedback from students and the committee provided the researcher with insights into the strengths of the questionnaire and the instruments and highlighted areas of improvement, and revisions were made accordingly.

The Research Self-efficacy Scale (RSES; Greeley et al., 1989)

This instrument was developed by Greeley et al. (1989) and is a 38 item scale designed to measure an individual's perceived ability to perform various research tasks (i.e., choose methods of data collection, perform experimental procedures, and synthesize results with regard to the current literature). This instrument is provided for illustration in Appendix E. Participants were asked to rate the degree to which they felt confident in their ability to accomplish each item, ranging from 0 (not confident) to 100 (totally confident), (e.g., choose appropriate data analysis techniques). Bieschke and colleagues (1995) reported a high internal consistency for the total scale (.96). In addition, Bieschke and colleagues (1996) found evidence of construct validity in their factor analysis (fit indices) of the RSES. Holden and colleagues (1999) found the RSES to

have good internal consistency with Chronbach's alphas of .94 at pre-test and post-test respectively.

Other studies supported the psychometric soundness of the RSES (e.g., validity and reliability). Kahn, Forester and Hesson-McInnis (2004) performed a factor analysis on the RSES and determined that there was solid construct validity. The population used in the factor analysis on the RSES was comprised of 1,004 graduate students that completed an online survey and consisted of 80% female and 20% male participants. It was found that the standardized first-order factor loadings of the RSES, ranged from .48 up to .87, with a median score of .73. As for the second-order standardized factor loadings of the RSES, it was observed that they ranged from .75 up to .95, indicating strong relationships between the items in the second factor loading. Unrau and Beck (2004) utilized the RSES in their study on increasing research self-efficacy (among Social Work [$n = 60$] and Speech-Language Pathology students [$n = 75$]) and determined that the RSES had strong internal reliability. The results of this analysis were based on a pre-test, post-test result where it was found that both the social work group and the speech-language pathology students had an increase in their confidence in performing research tasks. The internal consistency for the RSES was found to be equal and had a Cronbach's alpha score of .94 for the pre-test, post-test measurements. This indicates that there was strong internal consistency for the RSES in terms of the pre-test, post-test criteria. In addition, Faghihi (1998) determined that the RSES demonstrated adequate internal reliability consistency (.95) in her research ($N = 97$) with a population of doctoral level counseling (and related disciplines) students.

Interest in Research Questionnaire (IRQ; Bishop & Bieschke, 1994)

The IRQ is a 16 item scale developed by Bishop and Bieschke (1994), each of which is a different research activity. The purpose of this instrument is to measure participants' interest in research-oriented activities. Respondents use a scale of 1 (very disinterested) to 5 (very interested) to gauge the degree of interest in a particular research task (e.g., conceptualizing a research study and conducting a literature review). The IRQ is provided in Appendix C for illustration. Data on internal consistency resulted in coefficient alphas of .89 (Bishop & Bieschke, 1994; $N = 184$) and .90 (Bishop et al., 1995; $N = 177$). In both cases, these studies (Bishop & Bieschke; Bishop et al.) illustrated, that on two separate occasions, the internal consistency measure of the IRQ was very high as both were greater or equal to .89. Since the studies were conducted one year apart from one another, this provided more evidence that the IRQ is a consistent measure because the reliability between the items from one year to the next remained almost the same.

Love and colleagues (2007; $N = 131$) determined that the internal consistency, using the IRQ for their study, was evidenced by a Chronbach's alpha of .93. This is similar to the results of Bishop and Bieschke (1994) and Bishop and colleagues (1995) where a relatively high internal consistency measure was observed. Therefore, the IRQ has been shown to be a reliable instrument, meaning that one is able to gather a reliable measure of the desired construct of the student's interest in research. This is further illustrated by Bard and colleagues (2000; $N = 203$), where the IRQ demonstrated solid internal reliability and Jones (2006; $N = 143$), found that the IRQ had a .94 Cronbach's alpha. The above research studies detailed the psychometric properties of the IRQ and the RSES. The following section provides information about the research related to the Research Training Environment Scale – Revised (RTES-R).

Research Training Environment Scale – Revised (RTES-R)

The Research Training Environment Scale – Revised (RTES-R, Gelso et al., 1996) is a 54 item scale with nine subscales. Each subscale is designed to capture a part of the research training environment such as how well faculty members' model appropriate scientific behavior. RTES-R's purpose is to measure respondents' perceptions with regard to their research training environment. This instrument is provided in Appendix D for illustration. There is a 5-point Likert type rating scale from 1 (disagree) to 5 (agree). An example of an item is "most faculty do not seem to care if students are genuinely interested in research." Internal consistency over a four week period was indexed, via Pearson's r and found to be roughly .83 (Gelso et al., 1993; $N = 150$). Gelso and colleagues (1996; $N = 171$) and Kahn (2001; $N = 149$) both found discriminant and convergent validity in their study using the RTES-R. Gelso and colleagues (1996) reported test-retest reliability for each subscale ranging from .74 to .94. These studies illustrated that both the convergent validity and the test-retest reliability of the RTES-R were satisfied. This indicated that not only do the results of this instrument relate to those of other instruments that measure a similar operational construct, but that the measurements were also consistent over time.

In addition, a study conducted by Faghihi (1998; $n = 97$) using the RTES-R, revealed an internal reliability consistency of .88. In order to check the reliability of the RTES-R, Faghihi used an item analysis in order to determine whether the deletion of any items from the instrument would increase the reliability by at least .05. It was determined that every one of the items contributed to the validity of the instrument. Thus, the items on the survey were highly correlated with one another, supporting that they are measuring the same construct. Thus, the implementation of the RTES-R was appropriate for this study, since it has been shown on several occasions to be a valid and reliable tool. Hence, one would be able to obtain adequate

measurements of the construct in order to make correlational inferences between the variables of the study.

Furthermore, Hollingsworth's (2000; $N = 278$) findings determined evidence of construct validity using the RTES-R. Therefore, there is evidence for the use of the RTES-R because the construct validity of the instrument examines the relationships between the scores on the instrument with those of some other criterion (Cozby, 2001). In other words, there was evidence that the RTES-R measure was found to be significantly related other criterions. It was also found that there was positive convergent validity due to positive correlations between the RTES scores, interest in scientific activities and measures of research self-efficacy as noted by Khan and Miller (1997, $N = 267$). This provided evidence that the RTES scores were significantly related to interest in scientific activities, and measures of research self-efficacy scores, which are a key component of the current study. For this reason, the RTES-R instrument operationalized the construct as a continuous value that allows one to determine the relationship between that construct and other variables of interest (i.e., interest in research and research self-efficacy). In summary, the above research detailed the psychometric properties of the RTES-R. The following section provides information about the data collection process for the current study.

Data Collection

For the data collection process of this study, a cover letter explaining the purpose of the study and a letter of informed consent was enclosed in a packet that contained the demographic questionnaire, the Research Self-Efficacy Scale – Revised, the Research Training Environment Scale – Revised, and the Interest in Research Questionnaire. The data collection packets were then distributed amongst the program coordinators at 16 of the schools (CACREP accredited Counselor Education doctoral programs). A one dollar bill was included as an incentive as per

Dillman's (2007) survey research guidelines. There were three programs that chose not to appoint a coordinator to distribute the packets. In those cases, the researcher sent a letter to the contact established at the program, extending an invitation to counselor education doctoral students to participate in the study and the contact distributed the invitation via ListServ. The researcher contacted each Council for Accreditation of Counseling and Related Educational Programs (CACREP) program and requested the number of doctoral students enrolled in order to be cognizant of the number of packets to assemble. Once the packets were sent out, the researcher followed up with a letter thanking those who responded and asking those who had not to do so.

The researcher followed the tailored design method outlined by Dillman (2007). Dillman suggested the following steps in the survey research process in order to ensure the highest response rate possible:

1. An approach letter should be sent to the target population explaining to them the purpose of the survey, alerting them to the fact that the questionnaire was in the mail, and explaining why their participation was appreciated.
2. A cover letter is then sent out (usually a few days after the approach letter) accompanied by the questionnaire and a pre-paid reply envelope and a financial incentive – typically a one-dollar bill. The cover letter includes such items as: (a) why the respondent was chosen, (b) usefulness of the survey, and (c) confidentiality information.
3. A follow up letter or postcard (this researcher used email for this purpose) is then mailed out to the participants (typically four to eight days after sending the cover

letter and questionnaire packet). The purpose of the letter is thank those who have already responded as well as asking those who haven't responded to do so.

The packets were due to the researcher by February 20, 2008. By returning the packet to the researcher, this provided confirmation of informed consent by the doctoral student. Those who did return the instrument packet by the end of the study date were not included in the analysis. In order to assure anonymity for the participants, no names were collected on any of the instruments. The only identification that was provided was an identification number assigned to the participants so that their information was kept together. After all the packets had been collected from the participants, the information was scored using the Statistical Package for Social Science (SPSS) software, Windows version 14.0 (2005) for future analysis. Subsequently, the completed instruments were kept by the researcher in a locked filing cabinet that only the researcher has access to and will be stored there until the time in which the data may be destroyed.

Data Analysis

The data analysis for this study was conducted using two statistical procedures, which included Pearson's correlation coefficients (two-tailed) and analysis of variance (ANOVA). Pearson's correlation coefficients were implemented in order to determine whether there was a statistically significant relationship between the research self-efficacy, the research training environment, and the interest in research variables (Research Question 1). Pearson's correlation coefficients was appropriate for this research question as one of the variables can be operationalized as continuous variables (Shavelson & Towne, 2002). The second statistical procedure implemented was an ANOVA, which was used to examine the second and third research questions. The ANOVA was an appropriate choice to analyze these research questions

since the researcher was able to conduct an analysis with continuous dependent variables and categorical independent variables (Mertler & Charles, 2008). A multiple regression procedure was utilized to determine if there was a significant relationship between the constructs of research self-efficacy, interest in research, and the research training environment. Multiple regression allows the simultaneous testing and modeling of multiple independent variables (Moore & McCabe, 2006).

Pearson's correlation coefficients is a statistical procedure that was used in order to determine whether there was a statistically significant relationship between two continuous variables (Bakeman & Robinson, 2005). For this study, the correlation between research self-efficacy, the research training environment, and the interest in research variables was computed and then analyzed to determine whether there was a significant relationship between them. Similarly, a multiple regression procedure was implemented in order to determine if there was a significant relationship between research self-efficacy, the research training environment and the interest in research variables at the same time. By using the multiple regression model the researcher is able to control for the other independent variables that are included in the model in order to determine whether each have a significant impact on the dependent variable at the same time (Tabachnick & Fidell, 2001). This means that the regression equation that was used for research question one was the following:

$$Y = A + B_1X_1 + B_2X_2 + e$$

where Y is the dependent variable of research self-efficacy, A is the intercept of the model, B₁ represents the coefficient for the independent variable of research training environment (X₁), B₂ is the coefficient for the independent variable interest in research (X₂) and e is the random error term that has a mean of zero and common variance equal to σ^2 (Keuhl, 2000). In this case, the

coefficient of B_1 and B_2 represent the strength and direction of the relationship between the research training environment and the interest in research variables and the research self-efficacy variable.

The ANOVA procedure is a statistical method used to determine whether an independent (or multiple independent) variable has a significant impact on a single dependent variable (Jaccard & Becker, 2002). For analytical purposes, the dependent variable in the ANOVA is a continuous variable that can take on a wide range of values, whereas the independent or independent variables are usually categorical in nature (Moore & McCabe, 2006). This means that the independent variables are comprised of two or more specific levels or categories. The advantage of utilizing an ANOVA was that one would also be able to fit several other independent variables to the model at the same time if required. In other words, one is not limited to only including one variable in the analysis and it is important since this allows one to control for a number of variables that may be related to the dependent variable.

When the variables have been included in the ANOVA model, the results would indicate whether an individual or several independent variables contribute to the explanation in the variation of the dependent variable. In summary, if a variable is found to be significant, then it could be concluded that this variable contributed to the explanation in the variation of the dependent variable (Moore & McCabe, 2006).

If it is found that there is a significant relationship between the independent and dependent variables then the test statistic will exceed a critical value based on the degrees of freedom observed for the ANOVA. For the ANOVA, the test statistic that is used to assess the relationship is the F-statistic. The F-statistic follows an F-distribution, where the significance of the F-statistic is based on whether it is found to be greater than a critical F-value on $k - 1$ and $n -$

$p - 1$ degrees of freedom (where k is the number of categories for the independent variable, p is the number of parameters that are estimated in the model and n is the total number of observations) (Moore & McCabe, 2006).

When a significant relationship is found between the independent and dependent variables, one needs to determine how the independent variable is related to the dependent variable. In order to do determine this, one must calculate the least significant difference (LSD) statistics, which computes the difference between the different categories or levels of the independent variable. In other words, this would provide evidence of whether or not a certain level or category score is higher or lower on scores of the dependent variable than the reference (Keuhl, 2000).

For research question number two, the dependent variables were research self-efficacy and interest in research, while the independent variable of interest was the level of education of counselor education doctoral students (students who had completed their second year, third year [or higher] of doctoral preparation and students in their first year, second semester of courses). To determine whether there was a difference between students who had completed their second, third year (or higher) of preparation and students in their first year, second semester of courses, with respect to their research self-efficacy and interest in research, the ANOVA was implemented. In both cases, differences between the students who had completed their second year, third year (or more) of doctoral preparation and students in their first year, second semester of courses was be determined by using the LSD procedure in order to ascertain which students scored higher on either the Research Self-efficacy and Interest in Research scales.

For research question number three, the dependent variables included research self-efficacy, perceptions of research training environment, and interest in research; while the

independent variables were the demographic variables of gender, age, race, years of post-graduate experience, and scholarly activity. To determine whether there was a difference between participants' gender, age, race, scholarly activity and years of post-graduate education, with respect to their research self-efficacy, the perceptions of research training environment, and interest in research, three separate ANOVAs were implemented. In all three cases, if there were differences between the genders of the students, age, race, scholarly activity or the number of years of post-graduate education, then the LSD procedure was implemented.

Summary

This chapter detailed the methodology that was implemented in the study in order to determine whether there were significant relationships between research self-efficacy, the perceptions of research training environment, and interest in research as well demographic variables. The chapter presented the research design, research questions and hypotheses, target population and sampling plan, the instrumentation, data collection procedures, and statistical analysis for this study. The following chapter, chapter 4, presents the results and findings of the research based on the statistical analysis procedures and methodology discussed in this chapter.

CHAPTER FOUR: RESULTS

This chapter presents the findings and results of the statistical analyses implemented in order to determine whether there were significant relationships between research self-efficacy, perceptions of the research training environment, and interest in research with a national sample of counselor education doctoral students. The chapter is arranged into the following sections: (a) Overview, Sampling and Data Collection Procedures; (b) Sample Demographics and Descriptive Statistics; (c) Data Analyses and Results for Research Hypotheses/Questions; and (d) Summary of Results.

Overview, Sampling and Data Collection Procedures

An ex-post-facto, cross-sectional, correlational research design was employed to examine the objectives of this study, which were to determine whether there were significant relationships between research self-efficacy, perceptions of the research training environment, and interest in research with a national sample of counselor education doctoral students. The dependent variable was research self-efficacy and the independent variables were interest in research and research training environment. Included in the analysis were the demographic characteristics reported by counselor education doctoral students that participated in the study (i.e., the age range of the students, their gender, level of education, scholarly activity, ethnicity, program location, number of doctoral-level research courses taken, professional aspirations number of years of post graduate counseling experience, and area of specialization).

The target population for this study was comprised of counselor education doctoral students who were in their first year, second semester; and second year; third year (and higher) in Council for Accreditation of Counseling and Related Educational Programs (CACREP)

accredited counselor education programs. The counselor education doctoral students attended one of the forty-six CACREP accredited counselor education doctoral programs. All of these programs were contacted and invited to participate in this study and 19 CACREP accredited programs chose to participate. There were three programs that chose not to appoint a coordinator to distribute the packets. In those cases, the researcher sent a letter (to three of the programs) to the contact established at the program, extending an invitation to counselor education doctoral students to participate in the study and the contact distributed the invitation via ListServ.

A total of 141 survey instrument packets were mailed to the 16 participating program coordinators of so that the data collection instruments could be distributed to each potential participant. Some programs chose not to have a program coordinator involved in the dissemination of the data collection instruments; therefore, a letter from the researcher (via listserv) was delivered to the students (via the contact at the program) requesting participation in the study. Of the 141 survey instruments that were delivered to the potential participants, 89 returned a complete instrumentation package (63.1 % response rate).

For the purpose of this study, the research self-efficacy of the participants was measured by The Research Self-efficacy Scale - Revised (Greeley et al., 1989), which consisted of values that ranged from 0 (no confidence) up to 100 (complete confidence). The perception of the research training environment was measured by the Research Training Environment Scale – Revised (Gelso et al., 1996), which consisted of values that ranged from 1 (disagree) to 5 (agree). Finally, interest in research was measured by Interest in Research Questionnaire (IRQ; Bishop & Bieschke, 1994), which consisted of values that ranged from 1 (very interested) up to 5 (very uninterested). For this reason, to construct the research self-efficacy, perceptions of the research training environment, and interest in research variables for the subsequent analyses, the scores

for each item were averaged for each individual in the study. The scoring of the data collection instruments was completed by summing the values of the responses provided on each of the scaled responses, and then averaging them by the number of responses provided on the survey instruments, according to the data collection instruments instructions.

Data collection means scores were used in the data analyses because there were several participants who did not provide a response for certain items. For this reason, if the sum total scores were used those participants who did not fill in one or two items would not have a representative score, when compared to those participants who did not have any responses. By averaging the scores for each of the instruments, these participants were able to be included in the subsequent analyses. Additionally, by using the data collection instrument mean scores, the variability between the participants' responses would be reduced making the estimates a more precise estimate (Tabachnick & Fidell, 2001). The variability in the data represented the amount of spread or distribution the scores have about their mean value. The higher the variance the more spread out the data would be, while the smaller the variance the more concentrated the distribution would be.

Reliability Analysis

In order to address the research questions for this study, a reliability analysis was implemented in order to determine whether the items that comprised the research self-efficacy, perceptions of the research training environment, and interest in research variables were a reliable measure of these variables for this data. In order to accomplish the reliability analysis, Cronbach's alpha statistics were calculated. If a value of .70 was observed, it was concluded that the items that comprised the research self-efficacy, perceptions of the research training environment, and interest in research variables measured those variables (Jaccard & Becker,

2002). The reasoning behind the above was that there was adequate evidence that the items correlated with one another, indicating that they measured the same variable (Mertler & Charles, 2008).

To conduct the analysis of variance (ANOVA) and multiple regression analysis, the research self-efficacy, perceptions of the research training environment, and interest in research variables were operationalized as continuous variables. A reliability/internal consistency analysis was implemented in order to determine whether the statements on the survey instruments adequately addressed the research self-efficacy, perceptions of the research training environment, and interest in research variables. If the construct was found to have an internal consistency statistic, as measured by Cronbach's alpha, of 0.70 or greater, it was concluded that the statements adequately measured the variable so that the scores were averaged to provide an overall measurement of the research self-efficacy, perceptions of the research training environment, and interest in research variables. The results of the reliability analysis are presented in Table 2.

Table 2. *Reliability Analysis for Research Self-Efficacy, Perceptions of the Research Training Environment, and Interest in Research*

Variable	Cronbach's Alpha	N of Items
Research Self-Efficacy	.958	38
Interest in Research	.931	16
Perceptions of the Research Training Environment	.778	54

(N = 89)

Based on the results presented in Table 2, it was inferred that there was a high internal consistency/reliability between the items on the questionnaires as indicated by the Cronbach's alpha statistics. The internal consistency measurement was $\alpha = .958$ for the research self-efficacy scale, which was significantly greater than the .70 cut-off value for the Chronbach's alpha. Similarly, the interest in research scale was found to have a very high internal consistency of $\alpha = .931$, which was significantly greater than the .70 cut-off value. As for the perceptions of the research training environment, it also had an internal consistency measurement of greater than .70 ($\alpha = .778$), indicating that it was a reliable measure of the research training environment.

Sample Demographics and Descriptive Statistics

This section presents the descriptive statistics for the variables that were analyzed. It includes the calculation of the frequencies and percentages of occurrence for each of the categorical (or discrete) variables in the study. In addition, the frequency tables for each of the variables were presented. The demographic variables included: (a) age, (b) gender, (c) level of education, (d) scholarly activity, (e) race/ethnicity, (f) location of program, (g) number of doctoral-level research courses taken, (h) professional aspirations, (i) specialization, (j) cohort model employed in doctoral program, (k) counselor education program track, (l) highest degree completed, and (m) graduate program completed. Similarly, descriptive statistics which included the means, standard deviations, and ranges for the continuous variables in the study were also presented. The descriptive statistics included the mean scores for the research self-efficacy, perceptions of the research training environment, and interest in research variables as well as number of years of post-graduate experience students had before beginning the doctoral program.

The descriptive statistics for each of the independent variables used in the study are presented in Table 3. They include the frequency and percentage of the (a) age, (b) gender, (c) level of education, (d) scholarly activity, (e) race/ethnicity, (f) location of program, (g) number of doctoral-level research courses taken, (h) professional aspirations, (i) specialization, (j) cohort model employed in doctoral program, (k) counselor education program track, (l) highest degree completed, and (m) graduate program completed of the participants.

Table 3. *Descriptive Statistics for Independent Variables Included in the Study*

Variable	Frequency	Percent
<i>Age</i>		
21-30	36	40.4%
31-40	34	38.2%
41-50	12	13.5%
50+	6	6.7%
Other	1/89	1.1%
<i>Gender</i>		
Female	59	66.3%
Male	29	32.6%
Other	1/89	1.1%
<i>Education Level</i>		
First Year	28	31.5%
Second Year	28	31.5%
Third Year or Greater	33/89	37.0%
<i>Scholarly Activity</i>		
No Publication	62	69.7%
National Publication (non-refereed)	15	16.9%
Refereed Publication	22	24.7%
State Publication	10	11.24%
Regional Publication	3	3.37%
No Presentation	38	42.70%
National Presentation	48	53.93%
International Presentation	5	5.62%
University Presentation	20	22.47%
<i>Race/Ethnicity</i>		
Asian	3	3.4%
Black/African-American	10	11.2%
White/Non-Hispanic	62	69.7%

Variable	Frequency	Percent
Latino/Hispanic	1	1.1%
Native American	3	3.4%
Multiracial	6	6.7%
Other	4/89	4.5%
<i>Location</i>		
AK	2	2.2%
AL	5	5.6%
CO	2	2.2%
ID	5	5.6%
IA	4	4.5%
ME	1	1.1%
NY	6	6.7%
NC	4	4.5%
PA	8	9.0%
VA	9	10.1%
FL	12	13.5%
TN	6	6.7%
AR	6	6.7%
NC	4	4.5%
OH	4	4.5%
MA	1	1.1%
NJ	1	1.1%
Not Specified	9	10.1%
<i>Specialization</i>		
Mental Health/Community	46	51.7%
School	19	21.3%
Marriage/Family	8	9.0%
Other	10	11.2%
Multiple	4	4.5%
No Response	2/89	2.2%
<i>Doctoral-Level Research Courses Taken</i>		
0	1	1.1%
1 to 2	38	42.7%
3 to 4	8	9.0%
5 and over	9	10.1%
Other (Multiple/Blank/Not Specified)	33/89	37.1%
<i>Professional Aspirations</i>		
Counselor Educator	42	47.2%
Supervisor	5	5.6%
Counseling Practitioner	19	21.3%
Other	7	7.9%
Multiple	15	16.9%
Not Specified	1/89	1.1%
<i>Counselor Education Doctoral Program Track</i>		

Variable	Frequency	Percent
Ph.D.	80	89.9
Ed.D.	7	7.9
Other	1	1.1
<i>Highest Degree Completed</i>		
Ed.S.	10	11.2%
M.Ed.	5	5.6%
M.A.	47	52.8%
Master's	7	7.9%
M.S.	19	21.3%
Other	1	1.1%
<i>Graduate Program Completed</i>		
M.A.	38	42.7%
Ed.	15	16.8%
M.S.	16	18.0%
Other	20	22.5%
<i>Cohort Model Employed in Doctoral Program</i>		
Don't know	1	1.1%
No	21	23.6%
Unsure	1	1.1%
Yes	61	68.5%
Missing/Blank	5	5.6%
<i>N = 89</i>		

Based on the frequency data results presented in Table 3, it was determined that the majority of the counselor education doctoral students in the study were female (66.3%, $n = 59$) with one individual specifying themselves as an “other” gender. Since there was only one observation for the “other” gender type, this participant was removed from further analyses ($N = 88$). The reason for was that there would not be enough information to obtain an adequate estimate for this variable. The most frequented age group reported was 21 to 30 years of age (40.4%, $n = 36$), which was closely followed by 31 to 40 years of age (38.2% $n = 34$). Similarly, there was one individual who classified themselves as “Other” for the age demographic and this observation was removed from future analyses as well ($N = 87$). Over half of the participants in the study reported to be at least in their second year of studies or other (68.5%, $n = 61$). The

ethnic majority of the participants were White/Non-Hispanic (69.7%, $n = 62$) with 17 states represented. Over half of the student participants reported that their area of specialization was in mental health/community (51.7%, $n = 46$), while 43.8% ($n = 39$) had taken fewer than two doctoral-level research courses. In terms of professional aspirations, almost half of the participants aspired to become a counselor educator (47.2%, $n = 42$).

As for the scholarly activity of the participants, it was reported that the majority did not have any scholarly publications (69.7%, $n = 62$). In addition, 27 (30.3%) participants were involved in scholarly activity. Fifteen (16.9%) had presented nationally and 22 (24.7%) had published in national refereed journals. Results indicated that over half of the participants (53.9%, $n = 48$) of the students had presented at the national level, while 22.5% ($n = 20$) presented at the university level.

The majority of the students were in the Ph.D. program in terms of the counselor education doctoral program track (89.9%, $n = 80$), while just over half of the participants had previously completed a Masters of Arts (M.A.) degree ($n = 47$, 52.8%) prior to beginning their doctoral programs. As for the graduate program completed, the most frequent response was for those who finished a Masters of Arts (M.A.) (42.7%, $n = 38$) degree. Finally, in term of whether their counselor education doctoral program employed a cohort model, the majority of the student participants reported that their program was used a cohort model (68.5%, $n = 61$).

The descriptive statistics for the remaining variables were calculated and presented in Table 4. The remaining demographic characteristics of the students were not included in the analysis because there were several missing responses and, for the most part, the responses were based on open-ended questions that resulted in responses that were not interpretable.

Table 4. *Summary Statistics for Years of Experience, Research Self-Efficacy, Perceptions of the Research Training Environment, and Interest in Research Scores*

	<i>N</i>	Range	<i>M</i>	<i>SD</i>
Years of Post Graduate Experience before Beginning Doctoral Program	88	0 to 22	3.41	4.37
Research Self-Efficacy	88	42.11 to 98.16	76.85	12.29
Interest in Research	86	1.31 to 5.00	3.57	.81
Perceptions of the Research Training Environment	86	2.43 to 4.09	3.15	.35

Based on the results presented in Table 4, it was found that the number of years of post graduate counseling experience ranged from a low of zero years of experience to a high of 22 years of experience. The years of experience were observed to have a mean score of 3.41 ($SD = 4.37$, indicating that the students in this study had a varying amount of experience). The research self-efficacy scores had a mean of 76.85 ($SD = 12.29$, Range: 42.11 to 98.16) with a score of 65 to 80 indicating a moderate level of research efficacy. The mean score of the interest in research was 3.57 ($SD = .81$; range: 1.31 to 5.00), indicating that the students in the study had a moderate level of interest in research. Finally, for the perceptions of the research training environment score, the mean was 3.15 ($SD = .35$; range: 2.43 to 4.09), indicating that the students had a moderate level of perceptions of the research training environment. For the interest in research and perceptions of the research training environment scores, it was observed that there were two missing values ($N = 87$). For this reason, these two observations were not included in the future analyses and therefore the results and findings were based on a total of 87 students. The

following section presents the results of the correlation, ANOVA, and multiple regression analyses for each research question.

Results and Findings

The following section reviews the results of the data analyses for the assessment of the research questions for this study. The statistical analyses that were implemented were used in order to determine whether there were significant relationships between the variables in the study, using the Statistical Package for the Social Sciences software (SPSS, 2005). The statistical procedures employed were comprised of Pearson's correlation coefficients (two-tailed), analysis of variance (ANOVA), and a simultaneous multiple regression analysis. Simultaneous correlation coefficients were used as they allow one to determine whether there is a significant relationship between two continuous variables in the study (Jaccard & Becker, 2002). Multiple regression analysis was used in order to determine whether two or more independent variables had an impact on the dependent variable in the study (Nardi, 2003). By using a multiple regression analysis, it allows one to be able to control for the other variable in the model in order to determine the overall significance of each variable when included in the model together.

The ANOVA was used to determine whether there were differences between independent variables when it came to one dependent variable (research self-efficacy, perceptions of the research training environment, and interest in research variables) (Tabachnick & Fidell, 2001). In other words, the ANOVA allows one to determine whether one or more independent variables (e.g., age, gender, years of post graduate counseling experience, and scholarly activity) effected the variation of the research self-efficacy, perceptions of the research training environment, and interest in research variables. If it was found that an independent variable significantly explained the variation in the dependent variable, then a post-hoc analysis was implemented. The post-hoc

that was implemented for this study was the Least Significant Difference (LSD) test. The reason for choosing the LSD method for this post-hoc analysis was because it allows one to be able to determine whether there are significant differences between the categories of the independent variables in the model (Moore & McCabe, 2006).

Research Null Hypothesis 1

There is no statistically significant relationship between research self-efficacy (as measured by The Research Self-efficacy Scale), perceptions of research training environment (as measured by Research Training Environment Scale – Revised [RTEs-R]), and interest in research (as measured by Interest in Research Questionnaire) in counselor education doctoral students?

In order to address the first research hypothesis, Pearson’s correlation coefficients (two-tailed) were calculated between each pair of research self-efficacy, perceptions of the research training environment, and interest in research variables. The results are presented in Table 5.

Table 5. Correlation between the Research Self-Efficacy, Perceptions of the Research Training Environment, and Interest in Research Scores

	1	2	3
1. Interest in Research	--	.122	.385**
2. Perceptions of the Research Training Environment		--	-.054
3. Research Self-Efficacy			--

Note: ** $p < .01$, $N = 87$

Based on the results presented in Table 5, it may be gleaned that there was only one significant correlation between the research self-efficacy, perceptions of the research training environment, and interest in research scores for this data. This statistically significant correlation was between the interest in research score and the research self-efficacy scores ($r = .385, p < .001$), with a small effect size ($r^2 = .148$). The other two correlations between the interest in research and perceptions of the research training environment, and the perceptions of the research training environment, and research self-efficacy were not statistically significant at the .05 level of significance ($r = .122, p = .265$; $r = -.054, p = .624$, respectively).

In order to determine if there was a significant relationship between these variables at the same time, a multiple regression analysis with both variables included in the model at the same time was conducted. Therefore, a simultaneous multiple regression analysis was conducted in order to assess the relationships between the independent and dependent variables in the model. For this analysis, the research self-efficacy scores were treated as the dependent variable, while the interest in research and perceptions of the research training environment were treated as the independent variables. The results for this multiple regression analysis are presented below (Table 6).

Table 6. *Multiple Regression Results for the Relationships between the Research Self-Efficacy, Perceptions of the Research Training Environment, and Interest in Research Scores*

<i>Parameter</i>	<i>B</i>	<i>Std. Error</i>	<i>t</i>	<i>Sig.</i>	η^2
Intercept	66.652	12.049	5.532	.000	.272
Interest In Research	6.069	1.558	3.897	.000	.156
Research Training Environment	-3.607	3.590	-1.005	.318	.012

$R^2 = .159, N = 87$

Based on the results presented in Table 6, it may be inferred that the perceptions of the research training environment did not have a statistically significant relationship with the research self-efficacy scores $t(82) = -1.01, p = .318$. As the perceptions of the research training environment increased the research self-efficacy scores were not affected, after controlling for the interest in research scores. When the interest in research scores were controlled, the scores were held constant for the participants in the study (Tabachnick & Fidell, 2001). On the other hand, interest in research did have a statistically significant relationship with the research self-efficacy scores $t(82) = 3.90, p < .001$. The model predicted that for every unit increase in the interest in research scores, the research self-efficacy scores would increase by 6.07 units, after controlling for the students' perceptions of the research training environment. Overall, using the R^2 values, one is able to determine the amount of variation as the dependent variable was explained by the independent variables included in the model (Moore & McCabe, 2006). Therefore, the amount of variation in the research self-efficacy scores that was explained by the interest in research was approximately 16% ($.159 * 100\%$). The 16% shared variance was a small to medium effect size between the variables in the study since the model was able to explain

10% to 30% of the variation in the model (Cohen, 1988). Thus, the null hypothesis was rejected as there was at least one significant correlation between the research self-efficacy, perceptions of the research training environment, and interest in research scores.

Research Null Hypothesis 2

There is no statistically significant difference between scores of research self-efficacy (as measured by The Research Self-efficacy Scale) and interest in research (as measured by the Interest in Research Questionnaire) between counselor education students who have completed their second year, third year (and higher) of preparation and first year, second semester students.

In order to address the second research hypothesis, an ANOVA was conducted with the research self-efficacy and interest in research scores treated as individual dependent variables. The independent variable was then the indicator variable and it consisted of the counselor education students who had completed at least their second year of preparation (and higher) and first year, second semester students. The results for the first ANOVA, where research self-efficacy was treated as the dependent variable, is presented in Table 7.

Table 7. *Analysis of Variance Results for Education Level on Research Self-Efficacy Scores*

Source	SS	df	MS	F	p	η^2
Education Level	358.278	1	358.278	2.400	.125	.028
Error	12391.934	83	149.300			

$R^2 = .028, N = 87$

Based on the results presented in Table 7, it is evident that the education level of the student did not have a significant impact on research self-efficacy scores at the .05 level of significance $F(1, 83) = 2.40, p = .125$ for this data. Therefore, there was no statistically significant difference between students in their first year, second semester of studies and students in their second year, and third year (and higher) when it came to the research self-efficacy scores. Therefore, the education level did not influence the research self-efficacy scores. In fact, the education level of the student was only able to explain 2.8% ($.028 \times 100\%$) of the variation in the research self-efficacy scores (Moore & McCabe, 2006). The results for the second ANOVA where interest in research was treated as the dependent variable, is presented in Table 8.

Table 8. *Analysis of Variance Results for Education Level on Interest in Research Scores*

Source	SS	df	MS	F	p	η^2
Education Level	1.629	1	1.629	2.546	.114	.030
Error	53.113	83	.640			

$R^2 = .030, N = 85$

Based on the results presented in Table 8, it was surmised that the education level of the student did not have a statistically significant impact on the interest in research scores at the .05 level of significance $F(1, 83) = 2.55, p = .114$ for this data. Therefore, there was no statistically significant difference between students in their first year, second semester of studies and those in at least their second year (or higher) of schooling when it came to the interest in research scores. Therefore, the education level did not influence the interest in research scores. In fact, the

education level of the student was only able to explain 3.0% (.030*100%) of the variation in the interest in research scores. In summary, in both analyses, the education level of the student did not have a statistically significant impact on either the research self-efficacy scores or the interest in research scores. Therefore, there is no evidence against the null hypothesis so it was not rejected.

Research Null Hypothesis 3

There is no statistically significant difference between scores of research self-efficacy (as measured by The Research Self-efficacy Scale), perceptions of research training environment (as measured by The Research Training Environment Scale – Revised [RTES-R]), interest in research (as measured by Interest in Research Questionnaire) related to counselor education students' demographic variables (gender, race/ethnicity, year in program, age, scholarly activity, specialization, doctoral-level research courses taken, location of program and professional aspirations).

In order to address the third research hypothesis, three ANOVA analyses were conducted with the research self-efficacy, perceptions of the research training environment, and interest in research scores treated as individual dependent variables. The independent variables were then the categorical variables of gender and age group as well as the continuous variables of level of experience and scholarly activity. The results for the first ANOVA where research self-efficacy was treated as the dependent variable are presented in Table 9.

Table 9. *Analysis of Variance Results for Gender, Age, Scholarly Activity, and Years of Experience on Research Self-Efficacy Scores*

Source	SS	df	MS	F	p	η^2
Gender	376.417	1	376.417	2.844	.096	.035
Age	161.694	3	53.898	.407	.748	.015
Scholarly Activity	1600.059	1	1600.059	12.090	.001	.134
Experience	40.618	1	40.618	.307	.581	.004
Error	10322.776	78	132.343			

$R^2 = .190, N = 85$

Based on the results presented in Table 9, one may infer that the gender of the student did not have a statistically significant impact on the research self-efficacy scores at the .05 level of significance $F(1, 78) = 2.84, p = .096$ for this data. Therefore, there was not a statistically significant difference between male and female students when it came to their research self-efficacy scores. As for the age of the student, it was found that age did not have a significant effect on the research self-efficacy scores, $F(1, 78) = .407, p = .708$, for this data, indicating that there was no statistically significant difference between the different age groups when it came to research self-efficacy scores. Similarly, it was found that the number of years of post-graduate counseling experience of the student did not have a significant effect on the research self-efficacy scores, $F(1, 78) = .307, p = .581$ for this data, indicating that there was no statistically significant effect between the number of years of experience and the research self-efficacy scores. The amount of scholarly activity the participants reported was statistically significant, however ($F [1, 78] = 12.09, p = .001$). In fact, the scholarly activity variable was able to explain

13.4% of the variation in the research self-efficacy scores, as indicated by the eta squared term in the last column of the above table. The eta squared term is similar to the R² value in that it indicates the amount of variation that is explained by each independent variable (Nardi, 2003). Based on this model, these variables were able to explain 19.0% (.190*100%) of the variation in the research self-efficacy scores. Since the scholarly activity of the student was found to be statistically significant, the Least Significant Difference (LSD) procedure was used to determine how those who had (Table 10).

Table 10. *Least Significant Difference Results for Gender Comparison*

<i>(I) Scholarly</i>	<i>(J) Scholarly</i>	<i>Mean Difference (I-J)</i>	<i>SE</i>	<i>p</i>
No	Yes	-9.759*	2.807	.001

Note: * $p < .05$, $N = 87$

Based on the results presented in Table 10, it was found that, on average, students with no scholarly experience ($n = 59$, 69.4%) scored lower than students with scholarly experience ($n = 26$, 30.6%) in terms of research self-efficacy scores for this data. Specifically, it was found that students with no scholarly activity experience, on average, scored 9.76 units lower on research self-efficacy scores when compared to students with some form of scholarly activity. This was indicated by the negative value located in the “*Mean Difference (I-J)*” column of Table 10. Based on these results, there was evidence against the null hypothesis because at least one of the demographic variables had a statistically significant impact on the research self-efficacy scores. Therefore, the null hypothesis was rejected in favor of the alternative hypothesis. The next

analysis presented is the ANOVA where the interest in research score was treated as the dependent variable. The results for this analysis are presented in Table 11.

Table 11. *Analysis of Variance Results for Gender, Age, Scholarly Activity, and Years of Experience on Interest in Research Scores*

Source	SS	df	MS	F	p	η^2
Gender	.027	1	.027	.039	.845	.000
Age	.546	3	.182	.265	.850	.010
Experience	.054	1	.054	.079	.780	.001
Scholarly Activity	.316	1	.316	.460	.499	.006
Error	53.586	78	.687			

$R^2 = .021, N = 87$

Based on the results presented in Table 11, the gender of the student did not have a significant impact on the interest in research scores at the .05 level of significance $F(1, 78) = .04$, $p = .845$ for this data; indicating there was not a statistically significant difference between male and female students when it came to their interest in research scores. As for the age of the student, it was determined that it did not have a significant effect on the interest in research scores, $F(1, 78) = .27$, $p = .850$ for this data. Therefore, there was no statistically significant difference between the different age groups when it came to the interest in research scores.

Similarly, it was found that the number of years of experience of the students did not have a significant impact on the interest in research scores, $F(1, 78) = .08$, $p = .780$ for this data; indicating that there was no statistically significant relationship between the number of years of

experience and the interest in research scores. The scholarly activity was also not significant, $F(1, 78) = .46, p = .499$. Based on this model, these variables were able to explain 2.1% (.021*100%) of the variation in the interest in research scores. Based on these results, there was no evidence against the null hypothesis so that it was not rejected. The next analysis presented is the ANOVA where the perceptions of the research training environment score was treated as the dependent variable. The results for this analysis are presented in Table 12.

Table 12. *Analysis of Variance Results for Gender, Age, and Years of Experience on the Perceptions of the Research Training Environment Scores*

Source	SS	df	MS	F	p	η^2
Gender	.001	1	.001	.012	.912	.000
Age	1.202	3	.401	3.474	.020	.118
Experience	.000	1	.000	.003	.953	.000
Scholarly Activity	.005	1	.005	.042	.838	.001
Error	8.995	78	.115			

$R^2 = .127, N = 87$

Based on the results presented in Table 12, there was evidence that the gender of the student did not have a significant impact on the perceptions of the research training environment scores at the .05 level of significance $F(1, 78) = .01, p = .912$ for this data. Therefore, there was no statistically significant difference between male and female students when it came to their perceptions of the research training environment scores. As for the age of the student, it was found that there was a significant difference between the perceptions of the research training

environment scores, $F(1, 78) = 3.47, p = .020$ for this data, indicating a statistically significant difference between the different age groups when it came to the perceptions of the research training environment scores. In fact, this variable was able to explain 11.8% of the variation in the research training environment scores, as indicated by the eta squared term in the last column of the above table. The eta squared term is similar to the R^2 value in that it indicates the amount of variation that is explained by each independent variable (Tabachnick & Fidell, 2001).

Alternatively, it was determined that the number of years of experience the student had did not have a statistically significant impact on the perceptions of the research training environment scores, $F(1, 78) = .003, p = .953$ for this data; indicating that there was no statistically significant effect between the number of years of experience and the research self-efficacy scores. The scholarly activity was also not statistically significant, $F(1, 78) = .04, p = .838$ for this data. Based on this model, these variables were able to explain 12.7% ($.127 * 100\%$) of the variation in the perceptions of the research training environment scores. Since the age of the student was found to be statistically significant, the Least Significant Difference (LSD) procedure was used to determine how the age groups of the students differed from one another (Table 13).

Table 13. *Least Significant Difference Results for Age Comparison*

<i>(I) Age</i>	<i>(J) Age</i>	<i>Mean Difference (I-J)</i>	<i>SE</i>	<i>p</i>
20 to 30	31 to 40	-.056	.087	.521
	41 to 50	.317*	.128	.016
	50+	-.045	.185	.806
31 to 40	41 to 50	.373*	.119	.002
	50+	.011	.174	.950
41 to 50	50+	-.362	.182	.050

Note: * $p < .05$, $n = 87$

Based on the results presented in Table 13, it was found that, on average, students between the ages of 21 to 30 ($n = 34$) scored higher than students between the ages of 41 to 50 ($n = 12$) in terms of their perceptions of the research training environment scores. It was determined that students between the ages of 20 to 30 scored .32 units higher on the perceptions of the research training environment scores when compared to students between the ages of 41 to 50, indicated by the positive value located in the “*Mean Difference (I-J)*” column of Table 12. The reason was that the students between the ages of 41 to 50 average scores were subtracted from students between the ages of 21 to 30 average scores, resulting in a positive value. Similarly, it was found that students between the ages of 31 to 40 scored higher than students between the ages of 41 to 50 in terms of their perceptions of the research training environment scores.

Specifically, it was determined that students between the ages of 31 to 40 scored .37 units higher on the perceptions of the research training environment scores when compared to students

between the ages of 41 to 50. Therefore, those students between the ages of 41 to 50 had the lowest scores on the perceptions of the research training environment when compared to students between the ages of 20 to 30 and 31 to 40. There were, however, no other statistically significant differences between the other age groups in the study at the .05 level of significance, meaning that those students between the ages of 20 to 30, 31 to 40 and over 50 years did not statistically differ from one another in terms of their perceptions of the research training environment. Based on these results, there was evidence against the null hypothesis because at least one of the demographic variables had a significant impact on the perceptions of the research training environment scores. Therefore, the null hypothesis was rejected in favor of the alternative hypothesis.

Additional Results and Findings

In addition to the previous demographic characteristics included in the analysis, four more demographic variables were taken into consideration. The variables included the race/ethnicity of the student, the number of graduate research courses completed by the student, the area of specialization of the counseling student, and their reported career aspirations. The location (state) which the student was from was not included in the analysis since there were several states that had so few responses (several of the states were observed to only have less than four observations for each). As a result of this, very poor estimates would be obtained for each of the different states if analyzed. Another reason was that there were only 85 observations used in the analysis. For this reason, valid inferences could not be made if this variable was included in the model, since there not enough observations in the study (i.e., lack of statistical power due to sample size).

Similarly, for the purposes of this analysis, some of the categories for the race/ethnicity of the student, the number of graduate research courses completed by the student, and the career aspirations of the student were collapsed so that there would be more observations for each category. The categories for the race/ethnicity of the student included African-American, White, and Other, while the number of courses taken included 1 to 2, 3 to 4, more than 5, and Other Response. The categories for specialization were mental health/community, school, marriage/family and other. Finally, the categories for the aspirations of the students were collapsed into counselor educator, supervisor, counseling practitioner, and 'other' response. In order to determine whether these variables had a significant impact on the research self-efficacy scores, interest in research and perceptions of the research training environment scores, three separate ANOVA were conducted. The above demographic variables were included in the model separate from the other demographic characteristics because there were only 89 students in the sample, meaning that the error degrees of freedom would be significantly reduced by including all of the new demographic variables. The results for the research self-efficacy scores are presented in Table 14.

Table 14. *ANOVA Results for Race/Ethnicity, Number of Research Course Taken, Professional Aspirations, and Research Self-Efficacy Scores*

Source	SS	df	MS	F	p	η^2
Race	322.083	2	161.042	1.026	.364	.027
Specialization	161.171	3	53.724	.342	.795	.014
Research Courses Taken	224.602	3	74.867	.477	.699	.019
Professional Aspirations	699.724	3	233.241	1.486	.226	.058
Error	11459.649	73	156.981			

a. $R^2 = .101$, $N = 87$

Based on the results presented in Table 14 there was no statistically significant effect between any of the added demographic characteristics of the students and the research self-efficacy scores because each one of their p-values was greater than the .05 level of significance. Even though none of the variables significantly explained the variation in the research self-efficacy scores, these variables were still able to explain 10.1% of the variation in the self-efficacy scores. Even though all of the variables were not statistically significant; they were still able to explain a small amount of the variation in the research self-efficacy scores. The next set of results presented is for the interest in research variable as the dependent variable in the study, which is presented in Table 15.

Table 15. *ANOVA Results for Race/Ethnicity, Number of Courses, Aspirations, and Interest in Research Scores*

Source	SS	df	MS	F	p	η^2
Race	2.970	2	1.485	2.387	.099	.061
Specialization	3.255	3	1.085	1.744	.166	.067
Research Courses Taken	1.201	3	.400	.643	.590	.026
Professional Aspirations	2.805	3	.935	1.503	.221	.058
Error	45.420	73	.622			

a. $R^2 = .170$, $N = 85$

Based on the results presented in Table 15 there was not a statistically significant relationship between any of the four added demographic characteristics of the students and the interest in research scores because each one of their p-values was greater than the .05 level of significance. Even though none of the variables significantly explained the variation in the interest in research scores, they were still able to explain 17.0% of the variation in the interest in research scores. Even though all of the variables were not significant; they were still able to explain a small amount of the variation in the interest in research scores. The next set of results presented is for the research training environment variable as the dependent variable in the study. These results are presented in Table 16.

Table 16. ANOVA Results for Race/Ethnicity, Number of Courses, Aspirations, and Research Training Environment Scores

Source	SS	df	MS	F	p	η^2
Race	.042	2	.021	.190	.827	.005
Specialization	.760	3	.253	2.317	.083	.087
Research Courses Taken	.953	3	.318	2.906	.040	.107
Professional Aspirations	.586	3	.195	1.785	.157	.068
Error	7.984	73	.109			

a. $R^2 = .225$, $N = 87$

Based on the results presented in Table 16 there was one variable that statistically significantly explained the variation in the research training environment variable, which was the number of research courses the student took, $F(3,73) = 2.91$, $p = .040$. None of the other demographic variables were statistically significant at the .05 level of significance for this data. With one significant variable, this model was able to explain 22.5% of the variation in the research training environment variable. Since there was a significant relationship between the number of research courses taken and the research training environment variable the LSD post hoc results are presented in Table 17. The results of the LSD test are presented in order to determine how the categories for number of research courses taken differ from one another.

Table 17. *Least Significant Difference Results for Research Courses Taken Comparison*

<i>(I) Course</i>	<i>(J) Course</i>	<i>Mean Difference (I-J)</i>	<i>SE</i>	<i>p</i>
1 to 2	3 to 4	.256	.136	.064
	Over 5	-.188	.135	.166
	Other Response	.118	.081	.148
3 to 4	Over 5	-.444*	.179	.015*
	Other Response	-.137	.140	.330
Over 5	Other Response	.307*	.134	.025*

Note: * $p < .05$, $N = 87$

Based on the results presented in Table 17, it was found that, on average, students who took three to four research courses ($n = 8$, 9.4%) scored lower than students who took more than five courses ($n = 8$, 9.4%) in terms of their perceptions of the research training environment scores. It was determined that students who took three to four research courses scored .44 units lower on the perceptions of the research training environment scores when compared to students who took over five courses. Similarly, it was found that students who took over five courses ($n = 8$, 9.4%) scored higher than students who had an “other response” ($n = 33$; 38.8%) in terms of their perceptions of the research training environment scores. Specifically, it was determined that

students who completed over five courses scored .31 units higher on the perceptions of the research training environment scores when compared to students who had an “other response”.

Summary

The results from the data analyses for this study are summarized in Table 18. In general, it was found that for research hypothesis one, the only statistically significant correlation of the research self-efficacy, perceptions of the research training environment, and interest in research scores was between the students' interest in research and the students' research self-efficacy scores for this data. This was the case for the bivariate correlations as well as the multiple regression analysis where the independent variables were controlled for in the model.

As for research hypothesis two, results indicated that there was no statistically significant difference between the students in their first year, second semester; second year, third year (and higher) when it came to research self-efficacy scores as well as interest in research scores. For the third research hypothesis, results indicated that when research self-efficacy scores were treated as the dependent variable in the ANOVA, the only demographic variable that had a significant impact was the scholarly activity of the student. In fact, it was found that students with no scholarly activity ($n = 59, 69.4\%$) had a tendency to score lower on average than students reporting some sort of scholarly activity ($n = 26, 30.6\%$) in terms of their research self-efficacy scores. When the interest in research variable was treated as the dependent variable, it was found that none of the demographic variables had a statistically significant impact on the scores. Thus, there was no evidence against the null hypothesis for this analysis.

Finally, when the perceptions of the training environment score was treated as the dependent variable in the ANOVA, the only demographic variable that had a statistically significant impact was the reported age of the student. Specifically, it was found that students

between the ages of 20 to 30, 31 to 40, and over 50 years did not statistically differ from one another in terms of their perceptions of the research training environment scores, but students between the ages of 41 to 50 did significantly differ from students between the ages of 20 to 30 and 31 to 40, when it came to their perceptions of the research training environment scores. When examining the race/ethnicity of the student, the area of specialization, the number of doctoral-level research courses taken, and professional aspirations, it was found that there was only one statistically significant relationship. This was between the number of doctoral-level research courses students had taken and the perceptions of research training environment variable.

Table 18. *Summary of Results and Findings for Research Questions*

Research Question	Findings
One (a): Correlation between research self-efficacy, perceptions of the research training environment, and interest in research scores	<ul style="list-style-type: none"> • Interest in research was positively correlated with research self-efficacy ($r = .385, p < .001$) • Interest in research was not correlated with the perceptions of the research training environment ($r = .122, p = .265$) • Perceptions of the research training environment was not correlated with research self-efficacy ($r = -.054, p = .624$)
One (b): Multiple regression between	<ul style="list-style-type: none"> • Interest in research was positively correlated

Research Question	Findings
research self-efficacy, perceptions of the research training environment, and interest in research scores	<p>with research self-efficacy, after controlling for perceptions of the research training environment ($p < .001$, $\eta^2 = .156$; 15.6%)</p> <ul style="list-style-type: none"> • Perceptions of the research training environment was not correlated with research self-efficacy, after controlling for the interest in research scores ($p = .318$, $\eta^2 = .012$; 1.2%)
Two (a): Education Level had an effect on the research self-efficacy scores	<ul style="list-style-type: none"> • Education level did not have a statistically significant effect to the research self-efficacy scores ($p = .125$, $\eta^2 = .028$; 2.8%)
Two (b): Education Level had an effect on the interest in research scores	<ul style="list-style-type: none"> • Education level did not have a statistically significant effect on the interest in research scores ($p = .110$, $\eta^2 = .030$; 3.0%)
Three (a): Age, Gender, and Scholarly Activity had an effect on the research self-efficacy scores	<ul style="list-style-type: none"> • Gender did not have a statistically significant effect on the research self-efficacy scores ($p = .096$, $\eta^2 = .035$; 3.5%) • Scholarly Activity did have a statistically significant effect on the research self-efficacy scores ($p .001$, $\eta^2 = .134$; 13.4%) • Age did not have a statistically significant effect on the research self-efficacy scores (p

Research Question	Findings
Three (b): Age, Gender, and Scholarly Activity had an effect on the interest in research scores	<p data-bbox="846 317 1162 348">= .748, $\eta^2 = .015$; 1.5%)</p> <ul style="list-style-type: none"> <li data-bbox="797 390 1422 569">• Gender did not have a statistically significant effect on the interest in research scores ($p = .845$, $\eta^2 < .001 < 0.1\%$) <li data-bbox="797 611 1422 789">• Scholarly Activity did not have a statistically significant effect on the interest in research scores ($p = .499$, $\eta^2 = .006$; 0.6%) <li data-bbox="797 831 1422 1010">• Age did not have a statistically significant effect on the interest in research scores ($p = .850$, $\eta^2 = .010$; 1.0%) <li data-bbox="797 1052 1422 1234">• Experience did not have a statistically significant effect on the interest in research scores ($p = .780$, $\eta^2 = .001$; 0.1%)
Three (c): Age, Gender, Scholarly Activity, and Experience had an impact on the perceptions of the research training environment scores	<ul style="list-style-type: none"> <li data-bbox="797 1272 1422 1524">• Gender did not have a statistically significant effect on the perceptions of the research training environment scores ($p = .912$, $\eta^2 < .001 < 0.1\%$) <li data-bbox="797 1566 1422 1818">• Scholarly Activity did not have a statistically significant effect on the perceptions of the research training environment scores ($p = .838$, $\eta^2 = .001$; 0.1%)

Research Question	Findings
<p>Additional Results: Race/Ethnicity, number of doctoral-level research courses taken, professional aspirations, and specialization with research self-efficacy.</p>	<ul style="list-style-type: none"> <li data-bbox="797 321 1409 573">• Age had a statistically significant effect on the perceptions of the research training environment scores ($p = .020$, $\eta^2 = .118$; 11.8%) <li data-bbox="797 615 1409 867">• Experience did not have a statistically significant effect on the perceptions of the research training environment scores ($p = .953$, $\eta^2 < .001 < 0.1\%$) <li data-bbox="797 909 1409 1161">• Race/Ethnicity did not have a statistically significant effect on the perceptions of the research self-efficacy scores ($p = .364$, $\eta^2 = .027$; 2.7%) <li data-bbox="797 1276 1409 1528">• Number of research courses taken did not have a statistically significant effect on the perceptions of the research self-efficacy scores ($p = .699$, $\eta^2 = .019$; 1.9%) <li data-bbox="797 1570 1409 1822">• Professional aspirations did not have a statistically significant effect on the perceptions of the research self-efficacy scores ($p = .226$, $\eta^2 = .058$; 5.8%)

Research Question	Findings
<p>Additional Results: Race/Ethnicity, number of doctoral-level research courses taken, professional aspirations and specialization with research self-efficacy.</p>	<ul style="list-style-type: none"> <li data-bbox="797 321 1409 573">• Specialization did not have a statistically significant effect on the perceptions of the research self-efficacy scores ($p = .795$, $\eta^2 = .014$; 1.4%) <li data-bbox="797 615 1409 867">• Race/Ethnicity did not have a statistically significant effect on the perceptions of the interest in research scores ($p = .099$, $\eta^2 = .061$; 6.1%) <li data-bbox="797 982 1409 1234">• Research courses taken did not have a statistically significant effect on the perceptions of the interest in research scores ($p = .590$, $\eta^2 = .026$; 2.6%) <li data-bbox="797 1276 1409 1528">• Professional aspirations did not have a statistically significant effect on the perceptions of the interest in research scores ($p = .221$, $\eta^2 = .058$; 5.8%) <li data-bbox="797 1570 1409 1822">• Area of specialization did not have a statistically significant effect on the perceptions of the interest in research scores ($p = .166$, $\eta^2 = .067$; 6.7%)

Research Question	Findings
<p>Additional Results: Race/Ethnicity, number of courses taken, professional aspirations, and specialization with research self-efficacy.</p>	<ul style="list-style-type: none"> <li data-bbox="797 317 1430 569">• Race/Ethnicity did not have a statistically significant effect on the perceptions of the research training environment scores ($p = .827$, $\eta^2 = .005$; 0.5%) <li data-bbox="797 611 1430 936">• Number of doctoral-level research courses taken had a statistically significant effect on the perceptions of the research training environment scores ($p = .040$, $\eta^2 = .107$; 10.7%) <li data-bbox="797 978 1430 1304">• Professional aspirations reported did not have a statistically significant effect on the perceptions of the research training environment scores ($p = .157$, $\eta^2 = .068$; 6.8%) <li data-bbox="797 1346 1430 1675">• Area of specialization did not have a statistically significant effect on the perceptions of the research training environment scores ($p = .083$, $\eta^2 = .087$; 8.7%)

CHAPTER FIVE: DISCUSSION

The primary purpose of this study was to examine the relationship between the constructs of research self-efficacy, research training environment, and interest in research within a national sample of counselor education doctoral students. Additionally, the study investigated the relationships between the three constructs and the following counselor education doctoral students' demographic variables: age, gender, education, years of post graduate counseling experience, scholarly activity, race/ethnicity, program location, counselor area of specialization, number of doctoral-level research courses completed, and professional aspirations. The chapter is divided into the following sections: (a) summary of the study, (b) sample demographics, (c) discussion of the research null hypotheses, (d) limitations of the study, (e) implications for counselor education and supervision, (f) directions for future research, (g) recommendations, and (h) summary.

Summary of Study

The most common educational model employed in doctoral student preparation has been the scientist-practitioner model. The goal of the scientist-practitioner model has been to develop both researchers and clinicians (Benjamin & Baker, 2000; Webb, 2005). Horn and colleagues (2007) noted that researchers have not been expected to divide their time evenly between these roles (scientist and practitioner). Rather they have been expected to develop “a dynamic understanding and influence” (p. 207) of both roles. Belar (2000) indicated that research has been important to counselor education because it has served as a gateway through which knowledge flows into the field.

Reviews of counselor education literature have revealed a paucity of research investigating the construct of research activity by counselor education doctoral students (Briggs, 2006; Miller, 2006; Reisetter et al., 2004). Reisetter and colleagues (2004) noted that weak connections between counselor education programs and research have not fostered explicit research identities. Magoon and Holland (1984) suggested that encouraging practitioners to conduct research is critical to maintaining separate and distinct fields in the behavioral sciences. Others have addressed the value of research experience (i.e., published articles and books) in the academic job marketplace of the 21st century (Glatthorn, 2002; McGrail, Rickard & Jones, 2006; Wilson, 2001). Research activity and productivity has been particularly true for counselor education professionals to remain competitive for tenure and promotion opportunities (Nyquist, 2002; Okech et al., 2003; Ramsey et al., 2002). Thus, research investigating constructs related to the development of counselor education doctoral students as researchers was determined to be important to support and advance counselor education as a field of study.

An ex-post-facto, cross-sectional, correlational research design was employed to examine the objective of this study, which was to determine whether there were significant relationships between research self-efficacy, perceptions of the research training environment, and interest in research. The study was conducted using a national sample of counselor education doctoral students in Council for Accreditation of Counseling and Related Educational Programs (CACREP) programs. The dependent variable was research self-efficacy (interval data), and the independent variables were interest in research (interval data), and perceptions of the research training environment (interval data). Additionally, included in the data analyses were the demographic characteristics reported by the counselor education doctoral student participants, (i.e., gender, race/ethnicity, year in program, age, scholarly activity, area of counseling

specialization, doctoral-level research courses taken, number of years of post-graduate counseling experience, and professional aspirations). Of the 141 data collection packets mailed to potential respondents, 89 student participants returned a completed instrumentation package for a 63.1% response rate. Response rates in similar research projects were 55% ($N = 267$) in a study by Kahn and Scott (2001) and 40% ($N = 167$) in a study by Okech et al. (2006).

Sample Demographics

Gender

The gender breakdown of the participants for the study was as follows: female (66.3%, $n = 59$), male (32.6%, $n = 29$) and “other” gender (1.1%, $n = 1$). The gender representation in the present study was consistent with previous research conducted using doctoral-level counseling and counseling psychology students as participants. Higher percentages of females than males have been represented in similar studies. Examples include Shivy et al.’s (2003) sample of 35 counseling psychology doctoral students including 25 women (71%) and 10 men (29%). Tang and colleagues (2004) surveyed 116 counselor education doctoral students comprised of 83% females ($n = 96$) and 27 % males ($n = 20$). Miller (2006) surveyed 103 counselor education doctoral students and determined that 35 (34%) were men and 68 (66%) were women.

Age

Within the current study, the age group with the highest number of participants was 21 to 30 years of age (40.4%, $n = 36$). This was closely followed by participants who were 31 to 40 years of age (38.2%; $n = 34$). The literature was examined to determine whether the age representation in the present study was consistent with that of prior researchers using doctoral-level counseling and counseling psychology students. Faghihi (1988) surveyed 97 doctoral

students in counseling psychology and related disciplines and found that the ages of the sample ranged from 27 to 63 years with a mean of 43.4 and mode of 47 years. Royalty and colleagues (1986) sampled 358 students in counseling psychology and determined that the mean age was 31 years ($SD = 5.1$) with a range of 22 -52 years. Participants in Jones' study (2006) were 121 counseling psychology doctoral students composed of females (80%, $n = 97$) and males (17%, $n = 21$), 3 of whom did not select an age. Overall, the age range of participants in the present study was consistent with that of participants in prior studies. In the current study, the age range most represented was 21-30, followed closely by the 31-40 years of age group.

Time in Counselor Education Doctoral Program

Regarding time enrolled in the doctoral counselor education program reported by participants in the study, first year students comprised 31.5% ($n = 28$), second year participants represented 31.5% ($n = 28$), and third year or greater students comprised 37.0% ($n = 33$). This indicated a fairly balanced distribution among first, second, and third year or greater students in the present study and was consistent with years in the program cited in prior research. Miller (2006) surveyed 502 counselor education doctoral students and found that the average length of time in the doctoral program was 2.22 semesters. Hollingsworth (2000) surveyed 200 doctoral students in counseling psychology and determined that the majority of the respondents were in their third (50.5 %, $n = 101$) and fourth years (44.5 %, $n = 89$) of their programs.

Ethnicity

The ethnicity reported by participants was: (a) White/Non-Hispanic (69.7%, $n = 62$), (b) Black/African-American (11.2 7%, $n = 10$), (c) Multiracial (6.7%, $n = 6$), (d) Other (4.5 7%, $n = 4$), (e) Asian (3.4 %, $n = 3$) and (f) Hispanic (3.4 %, $n = 3$). A majority of the participants

identified themselves as Caucasian. This was consistent with ethnicity reported in prior research. For example, Miller (2006) found that 69.9% of the counselor education doctoral students were Caucasian. Participants in Jones' study (2006) were comprised of 121 counseling psychology doctoral students, the majority of whom were White/Non-Hispanic (69 %, $n = 84$). Bard et al. (2000) surveyed 130 rehabilitation counseling faculty members with Caucasians totaling 80.6% of those studied. In Bishop and Bieschke's (1998) sample of 184 counseling psychology doctoral students, 81% were Caucasian.

Geographic Representation and Specialization

The respondents in the study were from a national sample of counselor education doctoral students at 19 universities nationwide. The findings regarding the geographic representation in the counselor education program were unique, as no other studies were found that specifically identified counselor education doctoral students' geographical representation.

Regarding areas of counselor specialization, a majority of the respondents cited their specialization as mental health/community counseling (51.7%, $n = 46$). The second highest percentage of respondents indicated a specialization in school counseling (21.3%, $n = 19$). These results were unique to the current study as there were no other studies were found that reported area of specialization specific to counselor education doctoral students.

Professional Aspirations

In terms of professional aspirations, almost half of the participants reported aspiring to become a counselor educator (47.2%, $n = 42$), followed by a counseling practitioner (21.3%, $n = 19$). This was consistent with the professional aspirations identified by some prior researchers. Jones (2006), for example, determined that the majority of the participants in her study had

career aspirations of working in academia (38%, $n = 46$), followed by private practice (21%, $n = 25$). In contrast, Geisler (1995) surveyed 255 counseling psychology doctoral students and determined that choices for employment upon graduation were as follows: counseling center (21%), private practice (20 %), and tenure-track job in academia (3%).

Scholarly Activity

Scholarly activity has been primary within doctoral-level counselor education programs. Participants in the present study, however, reported limited scholarly activity as evidenced by the majority (69.7%, $n = 62$) who reported not have any scholarly publications. Less than one-third, only 27 (30.3%) of participants, reported being involved in scholarly activity. Twenty-two respondents (24.7%) had published in refereed journals, while over half (53.9%, $n = 48$) had presented at the national level. Consistent with the current study findings, Miller (2006) surveyed 103 counselor education doctoral students and most reported limited scholarly activity. Her results indicated that only 21 (20.4%) students had published in national, refereed journals; 29 (28.1%) presented at national conferences, and 25 (24.3%) made presentations at the state level.

Number of Doctoral-level Research Courses Taken

Regarding the number of doctoral-level research courses completed in the doctoral counselor education program reported by the participants in the present study, the highest percentage (42.7%, $n = 38$) of the respondents reported taking 1 or 2 courses. Of those taking 1 or 2 courses, 10 (11.8%) were first year, second semester students; second year (11.8%, $n = 10$); third year (4.7.8%, $n = 4$); ABD (11.8%, $n = 10$); and “other” (2.4%, $n = 2$).

The results of Galassi et al. (1987) differed considerably from the current study findings. Galassi and colleagues surveyed 144 training directors from doctoral-level APA-approved

counseling psychology, counselor education, and non-APA-approved counseling psychology programs with regard to their training practices (including the number of general research courses taken during their programs). The average number of general research courses taken by students was 7.63, according to the program directors surveyed.

One of the possible reasons for this dramatic difference may be that Galassi et al. (1987) investigated not only counselor education programs but rehabilitation counseling, guidance and counseling, and marriage and family counseling programs, all of which have different research course requirements. The number of research courses completed, therefore, may not have been specific to counselor education doctoral programs. Furthermore, 26 programs had both counseling psychology and counselor education programs, so these programs were sampled randomly and thus there was no distinction between programs. Finally, among institutions and respondents, the definition of a doctoral-level research course may have differed and resulted in varying responses from participants.

Years of Post-graduate Counseling Experience Prior to Beginning Doctoral Program

The years of post-graduate counseling experience reported by the respondents, prior to beginning the doctoral program ranged from a score of zero to 22 years and was observed to have a mean score of 3.41 ($SD = 4.37$). The current study findings were consistent with findings of some other studies. Tang and colleagues (2004) surveyed 116 counselor education doctoral students and found that the majority of the students had 1-3 years post-graduate experience prior to entering doctoral programs. Black (1998) surveyed 229 counselor education doctoral students and found that the majority of the respondents (19.6%) reported one year of experience followed by two years (13.4 %) and three years (15.2%) of work experience, respectively.

Counselor Education Doctoral Program Track and Cohort Model Employed

The majority (89.9%, $n = 80$) of the current study respondents reported pursuing a Ph.D. degree as their counselor education doctoral program track. When asked if their doctoral program employed a cohort model, the majority (68.5%, $n = 61$) responded positively. These results were unique to the current study as there were no other studies found that reported counselor education program track and cohort model employed specific to counselor education doctoral students.

Highest Degree Completed and Graduate Program Completed

The majority (52.8%, $n = 47$) of the current study respondents reported that the highest degree completed was a Master of Arts (M.A.) degree. The majority of students (42.7%, $n = 37$) indicated that the graduate program they had completed was a Masters of Arts (M.A.) program. These results were unique to the current study as there were no other studies found that reported highest degree completed and graduate program completed specific to counselor education doctoral students.

In conclusion, the above summaries of demographic variables were provided to offer a comparison between counselor education doctoral student's demographic variables (i.e., age, gender, level of education, scholarly activity, race/ethnicity, location of program, number of doctoral-level research courses taken, professional aspirations, area of counseling specialization, cohort model employed, counselor education program track, highest degree completed, and graduate program completed) and those of similar studies.

Discussion of the Research Null Hypotheses

The following is a discussion of the findings reviewed per research null hypotheses.

Null Hypothesis 1

The first null hypothesis indicated that there was no statistically significant relationship between research self-efficacy (as measured by The Research Self-efficacy Scale), perceptions of research training environment (as measured by Research Training Environment Scale – Revised [RTES-R]), and interest in research (as measured by Interest in Research Questionnaire) in counselor education doctoral students. In order to address the first research null hypothesis, Pearson's correlation coefficients (two-tailed) were calculated between each pair of research self-efficacy, perceptions of the research training environment, and interest in research variables. Results indicated that there was only one statistically significant correlation between research self-efficacy, perceptions of the research training environment, and interest in research scores for this data. This correlation was between the interest in research score and the research self-efficacy score ($r = .385, p < .001$), indicating a statistically significant relationship, and a small to moderate effect size ($r^2 = 14.8$). These results suggested that the doctoral students in the study who had scores indicating a higher interest in research also demonstrated higher levels of research self-efficacy.

Other researchers have arrived at similar conclusions in their studies. Kahn and Scott (1997) sampled 265 counseling psychology doctoral students and determined that higher levels of research self-efficacy were correlated with greater interest in research ($r = .37, p < .001$). Bard and colleagues (2000) surveyed 333 rehabilitation counseling faculty members and found that research interest was significantly correlated with both research self-efficacy ($r = .28, p < .001$) and outcome expectations ($r = .78, p < .001$). West, Kahn and Nauta (2007) surveyed 132 counseling psychology graduate students and determined that there was a significant correlation between research self-efficacy and research interest ($r = .57$). They concluded that respondents

who indicated high levels of interest in research also demonstrated increased research self-efficacy.

The finding of the present study that there was a relationship between interest in research and research self efficacy, lends further credence to the findings of earlier researchers and has implications for counselor education programs. Betz (1997) indicated that early involvement in research and interest in research develops one's research self-efficacy and this, in turn, increased students' comfort levels in performing research. Love and colleagues (2007) noted the importance of getting students involved in research as early in their programs as possible. They found that mentoring and research teams contributed to increasing research self-efficacy among the doctoral students they surveyed. Phillips and Russell (1994) indicated that, consistent with self-efficacy theory, early involvement with research was correlated with direct performance accomplishment and was an important factor in determining self efficacy expectations. Gelso (1993) noted that the more motivated students are to conduct research, the more motivated they are to perform the necessary tasks to complete a research project. Encouraging and fostering students' interest in research increased their efficacy with regard to conducting research.

Null Hypothesis 2

The second research null hypothesis posited that there was no statistically significant difference between scores of research self-efficacy (as measured by The Research Self-efficacy Scale) and interest in research (as measured by Interest in Research Questionnaire) between counselor education students who have completed their first year, second semester of preparation; second year; and third year (or greater) of study. Research self-efficacy and interest in research were treated as individual dependent variables in the ANOVA used to test the second research hypothesis. Results indicated that in the present study the education level of the student

did not have a statistically significant effect on research self-efficacy scores at the .05 level of significance $F(1, 83) = 2.40, p = .125$ for this data. These findings were inconsistent with other researchers who often determined that education level did have an effect on research self-efficacy.

Phillips and Russell (1994) sampled 135 counseling psychology graduate students and found that advanced graduate students produced more research than did beginning students and, therefore, possessed higher levels of research self-efficacy. Kahn and Scott (2001) surveyed 267 counseling psychology doctoral students and determined that students' year in program helped to predict both career goals, research self-efficacy, and research productivity. Kahn and Scott (1997) reasoned that the longer students were in a program, the more access and opportunities they had to research. Kahn (2001) found direct relationships between research self-efficacy and a student's year in program.

In the present study, 37 % ($n = 33$) of the respondents were in the third year or higher of their programs as opposed to participants in Phillips and Russell's (1994) study where the majority were first (28; 22.4%) and second (28; 22.4%) year students. Similarly, the majority of Kahn and Scott's (1997) study participants was in their first (26%) and second (24%) year of study. The difference in respondents' year in program could also have accounted for the inconsistency between the current study results and previous research, in addition to the lack of variance in data in the current study.

Null Hypothesis 3

The third research null hypothesis posited that there was no statistically significant relationship between research self-efficacy (as measured by The Research Self-efficacy Scale), perceptions of research training environment (as measured by Research Training Environment

Scale – Revised [RTES-R]), interest in research (as measured by Interest in Research Questionnaire) and counselor education doctoral students' demographic variables (i.e., gender, race/ethnicity, year in program, age, scholarly activity, area of counseling specialization, doctoral-level research courses completed, location of program, and professional aspirations). In order to address the third research hypothesis, three ANOVAs were performed. Research self-efficacy, perceptions of the research training environment and interest in research scores were treated as individual dependent variables. The independent variables were the demographic variables.

Findings suggested that the gender of the student did not have a statistically significant effect on the research self-efficacy (RSE) scores at the .05 level of significance ($p = .748$, $\eta^2 = .015$) for this data. These findings were consistent with previous research. More specifically, Royalty and Magoon (1985) found that there was no significant relationship between gender, research self-efficacy and research productivity. Hollingsworth and Fassinger (2002) also reported a lack of a significant relationship between gender and its effects upon research self-efficacy. Both Mallinkrodt and Judge (1996) and Phillips and Russell (1994) determined that gender did not significantly impact research self-efficacy. Furthermore, Jones (2006) found that based on independent samples t-tests, there were no significant differences between the gender of the participants in terms of research self-efficacy, research productivity and interest in research. Thus, the finding in the present research that gender of the student did not have a statistically significant effect on research self-efficacy scores was supported by prior research results.

Other results of the current study indicated that scholarly activity had a small, yet statistically significant effect on research self-efficacy scores ($p .001$, $\eta^2 = .134$). These findings have been supported in the research as Kahn (2001) determined that scholarly activity was

directly predicted by research self-efficacy, year in program, and interest in research with 19% of the variance explained by scholarly activity. Phillips and Russell (1994) investigated the relationship between research self-efficacy (RSE), perceptions of the research training environment (RTE), and productivity for counseling psychology doctoral students with a national sample of 125 counseling psychology doctoral students. The respondents completed a demographic questionnaire, Self-efficacy in Research Measure (SERM) and a Research Training Environment Scale (RTES). Self-efficacy (as measured by the SERM) contributed indirectly to predicting productivity ($p = .04$, $F=23.0$, $p < .001$). In summary, these findings indicated a positive correlation between research self-efficacy, research training environment, and research productivity.

In the current study, respondents reported limited scholarly activity in that only 30.3 % ($n = 27$) were involved in scholarly endeavors and the majority (69.7%, $n = 62$) did not have any scholarly publications. The majority of the students in the current study had completed only one or two doctoral-level research courses. Consistent with the current study findings, Miller (2006) surveyed 103 counselor education doctoral students and most also reported limited scholarly activity. Furthermore, both Kahn and Scott (2001) and Bieschke and colleagues (1996) noted that as scholarly activity increased, so did research self-efficacy. Therefore, it may be inferred that if scholarly activity increased, then research self-efficacy would also increase.

Additional results of the present research suggested that the number of doctoral-level research courses taken had a small, statistically significant effect on students' perceptions of the research training environment ($p = .040$, $\eta^2 = .107$). These results were consistent with the findings of Unrau and Beck (2004) in their cross-sectional study of 135 graduate students in social work and speech-language pathology. Unrau and Beck determined that students who took

research and practice courses experienced gains in confidence and self-efficacy and had a more positive view of the research training environment than those who enrolled only in practice oriented courses. It may be inferred from the results of the present study and earlier studies that a higher number of doctoral-level research courses completed by students would lead to increased comfort with research activities and positive feelings about the research training environment.

Current study results also indicated that age had a small, statistically significant effect on the research training environment ($p = .020$, $\eta^2 = .118$). Findings indicated that students between the ages of 21 and 30 years of age, on average, scored higher on their perceptions of the research training environment (RTE) than did students in higher age categories. The results regarding age and its relationship to RTE were unique to this study, as no other studies were found that specifically explored this relationship. One possible explanation for the significant relationship between age and perceptions of the research training environment, based on the current study findings, is that doctoral students in the 21 to 30 age range were likely to have had more recent research experience. As recent graduates of master's degree programs, they would have been completed research course work and become familiar with the use and value of 21st century technology in conducting research. These prior experiences may have positively affected younger students' perceptions of the research training environment.

Potential Limitations

The results of the present study should be interpreted with caution in light of potential limitations. A correlational study design was implemented; therefore, non-causality was assumed. The design was not experimental in nature, and one would not be able to infer causal relationships because the research was limited to the associations and possible relationships between the variables being observed (Tabachnick & Fidell, 2007). In addition, even though

there was an above average response rate to the study (63.1 %) as compared to other studies (Kahn & Scott, 1997; Okech et al., 2006), the sample was not obtained randomly and therefore may have impacted the response rate (Siebert, 2006; Weathers, Furlong & Solorazano, 1993).

Another potential limitation was that the population sampled was specific to counselor education doctoral students from CACREP accredited programs. Therefore, it may not be generalizable to other fields of study and to non-CACREP programs. In addition, the study was ex-post-facto in design. It was not longitudinal in nature and captured only a “snapshot” of the participants’ perceptions at one point in time. If a longitudinal study had been conducted, there may have been greater statistical power and the capability to estimate a wider range of conditional probabilities (Yee & Niemeier, 1996). The design of the study prevented attributing causation to variables and could have impacted the generalizability of results.

Finally, the study relied on self-report of the participants and they may have been influenced in their responses by their interest in the topic of research. As a result, respondents may have decided to self-select in terms of participation. In addition, volunteers and non-volunteers may have been a potential limitation because of the fact that social desirability may have created a bias toward participating in the study and because volunteers and non-volunteers typically look different from one another (Tabachnick & Fidell, 2007).

Recommendations for Future Research

The following are several suggestions for future areas of investigation related to the present study. It is suggested, based on the data, that the current study be replicated over a period of time, perhaps the typical length of counselor education doctoral programs (roughly three to four years) and continue into the participants’ time post-doctoral work. This longitudinal research design would allow students to be followed from the beginning of their programs,

through completion, and into the professional arena. Investigations could focus on the three constructs investigated in this research (research self-efficacy, research training environment, and interest in research) and selected demographic variables.

It is also suggested, based on the data, that the present study be restructured to permit the use of mixed methods, to include the use of qualitative data (e.g., responses to open-ended questions and participant comments, focus groups and interviews). The inclusion of qualitative data would permit the researcher to gain the rich description and level of depth not provided in quantitative analysis (Bogdan & Bicklen, 2002). Integrating qualitative research inquiry would also be valuable to query respondents regarding their personal experience as doctoral students with mentoring opportunities. This would allow information to be gleaned as to factors which support or hinder the protégé and mentor dynamic.

It is also suggested that future research studies investigate the perceptions of the counselor education faculty as to the scholarly activity of counselor education doctoral students in their programs, based on the results of the current study data. Findings would provide information on factors potentially influencing the scholarship of doctoral students and contribute to what is, at the present, a limited body of literature. Results might be helpful in informing curricular development in counselor education doctoral programs, and creating a research training environment that both supports and fosters interest in research.

Implications for Counselor Education and Supervision

This study was initiated to investigate three constructs (research self-efficacy, research training environment, and interest in research) as they related to counselor education doctoral students. In addition, the following demographic variables were also explored and provide insight into the characteristics of average counselor education doctoral student: The variables

included: (a) age, (b) gender, (c) level of education, (d) scholarly activity, (e) race/ethnicity, (f) location of program, (g) number of doctoral-level research courses taken, (h) reported professional aspirations, (i) area of counseling specialization, (j) cohort model employed in doctoral program, (k) counselor education program track, (l) highest degree completed, and (m) graduate program completed. The following implications are based on the results of the study and are provided in order to encourage and foster doctoral students' research self-efficacy and interest in research and to improve research training environments.

Demographic Characteristics of the Average Counselor Education Doctoral Student

In terms of the demographics, the majority of the counselor education doctoral students in the study were female (66.3%, $n = 59$). The most frequented age group was 21 to 30 years of age (40.4%, $n = 36$) and over half of the participants in the study were observed to be at least in their second year of studies or later (68.5% $n = 61$). The ethnic majority of the participants were White/Non-Hispanic (69.7% $n = 62$) and half of the students said that their specialization was in mental health/community (51.7% $n = 46$), while 43.8% ($n = 39$) had taken fewer than two doctoral-level research courses. In terms of professional aspirations, almost half of the participants aspired to become a counselor educator (47.2% $n = 42$). As for the scholarly activity of the participants, it was observed that the majority did not have any scholarly publications (69.7%, $n = 62$), 15 respondents (16.9%) had presented nationally, and 22 (24.7%) had published in national refereed journals.

The majority of the students were in the Ph.D. program in terms of the counselor education doctoral program track (89.9%, $n = 80$), while just over half of the participants had previously completed a Masters of Arts (M.A.) degree (47, $n = 52.8%$) prior to beginning their doctoral programs. As for the graduate program completed, the most frequent response was for

those who finished a Masters of Arts (M.A.) (42.7%, $n = 38$) degree. Finally, in term of whether their counselor education doctoral program employed a cohort model, the majority indicated that it did (68.5%, $n = 61$).

The current study supported that scholarly productivity had a statistically significant effect on scores of research self efficacy ($p .001$, $\eta^2 = .134$). The scholarly activity variable was able to explain 13.4% of the variation in the research self-efficacy scores. Therefore, students with higher scores of research self-efficacy may be more efficacious in terms of scholarly productivity, than those with lower scores. Therefore, based on these findings it is recommended that research training begin early in the doctoral program, exposing students to different research methodologies that provide students not only with technical skills but also foster interest in research by engaging the students in the research and scholarly activity processes. Astromovich, Okech and Hoskins (2004) in their survey research with 106 counselor educators, found that 56% of respondents reported the need for further research training, specifically in quantitative methods. Okech and colleagues (2006) also found that counselor educators felt that there was a need for additional training of doctoral students in quantitative coursework. By making research both interesting and challenging to students, research self-efficacy and in turn productivity, may increase.

In order to increase students' research self-efficacy and interest in research, based on the current findings, it is suggested that faculty mentoring may provide students with positive research training environments (Briggs, 2006; Gelso, 2006; Love, 2007). Faculty can act as role models in the research process and provide students with collaborative research opportunities (Kahn, 2001). Okech and colleagues (2006) found that 93 % of the 420 counselor educators surveyed felt that mentoring was important in doctoral counselor education training programs.

Love and colleagues (2007) found that students who had access to effective research mentorship were more likely to become involved in research activities than were those who were not exposed to mentoring. Gelso (2006) suggested that faculty model “appropriate scientific behaviour and attitudes” (p. 6). Magoon and Holland (1984) noted that faculty who show respect for scientific inquiry and methods and who are persistent in their own research efforts, can positively influence students’ interest in research endeavors. Royalty and colleagues (1986) also found that faculty modeling had a significant impact upon students’ research interests.

Findings of the current study indicated that scholarly activity had a statistically significant effect on the research training environment. Therefore, in order to encourage and increase student involvement in research and scholarly activity, it is suggested that doctoral students be required to conduct original research and submit articles to national refereed journals and present at national and international conferences. Eisenhart and DeHaan (2005) suggested that programs encourage collaboration by doctoral students with faculty in other (related) disciplines in order to broaden their opportunities to build networks with other students and researchers. Love and colleagues (2007) found that faculty mentoring and support were the most important contributors to students’ satisfaction with the research training environment. Hollingsworth and Fassinger (2002) noted that students who had positive mentoring experiences during doctoral study were more likely to mentor others when they became faculty members. By incorporating such activities into the education requirements, as early in the program as possible, doctoral students have the opportunity to become immersed in positive and effective research training environments.

Findings also suggested that the demographic variables of age and doctoral-level research courses taken had a statistically significant effect on the perceptions of the research training

environment. The variables of age and doctoral-level research courses may have implications for counsellor education programs' admission processes to determine the population best able to be served by the program. Consideration should also be given, however, to systematic ways the diverse needs of admitted doctoral students can be addressed so as to foster an interest in research and research efficacy in a vibrant research training environment.

Based on the current study findings, it is also suggested that students be screened either in the admission process or during the first semester of their doctoral programs via the Vocational Preference Inventory-Form B (VPI-B; Holland, 1978), designed to determine the Holland (1985) personality type of the student and thus create research training programs specific to vocational personality types. For example, if someone had a Social vocational preference, then they would be less inclined to be interested in research and would need more research training and mentorship than someone who was of the Investigative vocational preference. Royalty and Magoon's (1985) findings supported the application of Holland's (1985) theory of career development in that counseling psychologists with varying personality types flourished in environments that were congruent to their type. Once the students' vocational preferences are identified via the VPI-B measure, students with Investigative (research-oriented) vocational preferences may be paired up to work with those who are less interested in research as a form of peer research mentoring. Webb (2004) administered Holland's (1994) Self-Directed Search measure in his research and determined that most of the students reported social vocational personalities, demonstrating less interest in research activities. Mallinkrodt, Royalty and Gelso (1990) surveyed 358 counseling psychologists and found that the Investigative personality type and some personality/environment interactions had the most influence on participants' levels of research interest.

Summary

In conclusion, this study was the first to examine the specific constructs of research self-efficacy, perceptions of the research training environment, and interest in research within a national sample of counselor education doctoral students. The current study was initiated to make an original contribution to the literature in the counselor education field. Interest in research was positively correlated with research self-efficacy. Findings suggested that the demographic variables of age and doctoral-level research courses taken had a statistically significant effect upon perceptions of the research training environment. In addition, results suggested that scholarly activity reported by doctoral level counsellor education students had a statistically significant effect upon their research self-efficacy scores.

APPENDIX A: INFORMED CONSENT

University of Central Florida
Department of Education

Consent to Participate in Research

Title of the Study:

Research Self-efficacy, Perceptions of Research Training Environment, Research Interest, and Counselor Education Doctoral Students

Principal Investigator: Nicole Vaccaro

Dear Doctoral Student:

My name is Nicole Vaccaro and I am a Doctoral Candidate in the Counselor Education program at the University of Central Florida working under the supervision of faculty members, Glenn Lambie, Ph.D. and Dean Sandra Robinson, Ph.D.

Purpose of the Study

I am conducting a study that investigates the relationship between research self-efficacy, perceptions of the research training environment, and interest in research of doctoral counselor education students.

Procedures

As a study participant, you will be asked to complete a demographic questionnaire and three survey instruments. Your identity and responses will be kept anonymous using a numerical coding system.

Risks

There are no known risks or discomfort associated with participation in this study. However, you may be inconvenienced by the time it takes to complete the packet.

Cost/Compensation

Participation in this research project will not cost you any money. You will be given a one dollar bill as an incentive for your participation in this study.

Confidentiality

Your participation in this study is anonymous. Your name or other identifying information will not be attached to any of the data collection instruments. All the information you provide will be identified by a code number. All information will be stored in a locked cabinet. When you mail the completed packet back to the researcher, this will indicate your informed consent.

The data collected will be used for statistical analyses and no individuals will be identifiable from the pooled data. The information obtained from this research may be used in future research and published. However, your right to privacy will be retained, i.e., your personal details will not be revealed.

Your participation in this research project is entirely voluntary. You do not have to participate. You do not have to answer any question(s) that you do not wish to answer. Please be advised that you may choose not to participate in this research study, or you may withdraw from the study at any time without consequence. Your department will not be notified of whether or not you participate.

If you have any questions or comments about this research, please contact Nicole Vaccaro at 407-XXX-XXXX, or my faculty supervisor, Dr. Lambie, University of Central Florida, College of Education, Counselor Education Program, Orlando, FL, 32816-1250 or at 407-823-2835. Questions or concerns about research participants' rights may be directed to the UCF IRB office, University of Central Florida Office of Research & Commercialization, 12201

Research Parkway, Suite 501, Orlando, FL, 32826-3246. The phone numbers are 407-823-2901 or 407-882-2276.

Sincerely,

Nicole Vaccaro

APPENDIX B: DEMOGRAPHIC QUESTIONNAIRE

This information is being collected for the researcher's records only. It is anonymous and will be locked in a file cabinet separate from the completed inventories. Please answer the attached inventories as honestly as you can. Do not spend a lot of time thinking about your answers. Provide the first response that seems accurate for you. If you choose to respond using "other" please place an "x" next to that selection and specify the answer, if possible. When being offered a selection of choices, please circle the most appropriate one for you.

(1) **Gender (please circle):** (a) Female (b) Male (c) Other _____

(2) **Age:** (a) 20-30 (b) 31-40 (c) 41-50 (d) 51-60 (e) 60+ (f) Other _____

(3) **Race/Ethnicity (please circle):**

(a) Asian (b) Black/African American (c) White/Non-Hispanic

(d) Latino/Hispanic (e) Native American (f) Multiracial (g) Other _____

(4) **Point in Counselor Education Doctoral Program (please circle):**

(a) First Semester (b) Completed 2nd Year (c) ABD Status (d) Other _____

Please specify location of program (state): _____

(5) **Counselor Education Doctoral Program Track:** (a) Ph.D. (b) Ed.D. (c) Other: _____

(6) **Highest Degree Completed:** _____

(7) **Graduate Program Completed (e.g, M.A in Counselor Education)**

(specify): _____

(8) **Specialization:** (a) Mental Health/Community (b) School (c) Marriage/Fam. (d) Other

(9) **Graduate Program Accreditation:** (a) CACREP (b) APA (c) Other

(10) **Number of Graduate Research Courses Completed (doctoral level):** _____

(11) **Does your Counselor Education Doctoral Program Employ a Cohort Model?** _____

(12) **Number of Post-graduate Years of Counseling Experience Prior to Beginning Your Doctoral**

Program: _____

(13) **Following the completion of your doctoral degree, what are your occupational aspirations?**

(a) Counselor Educator (full-time, academic setting)

(b) Supervisor (agency or school supervisor/coordinator/administrator)

(c) Counseling Practitioner (e.g., mental health, family, or school counselor)

(d) Other (specify if poss.): _____

(14) At this point, have you published any scholarly works (e.g., refereed journal articles)?

Yes or No (please circle)

If you answered “yes”, please list number and type of scholarly works:

(15) Have you presented at international and/or national Counseling-related conferences?

Yes or No (please circle)

If yes, please indicate how many: _____

APPENDIX C: INTEREST IN RESEARCH QUESTIONNAIRE

Using the 5-point scale provided, please indicate the degree of interest you have in the activities listed below. Please remember that the term “research” encompasses both quantitative and qualitative approaches, for this purpose of this instrument.

1	2	3	4	5
very uninterested		indifferent		very interested

- _____ 1. Reading a research journal article
- _____ 2. Being a member of a research team
- _____ 3. Conceptualizing a research study
- _____ 4. Conducting a literature review
- _____ 5. Developing funding proposals
- _____ 6. Having research activities as part of every work week
- _____ 7. Conducting research at the site of counseling practice
- _____ 8. Taking a research design course
- _____ 9. Taking a statistics course
- _____ 10. Developing a data analysis strategy for a research study
- _____ 11. Analyzing data
- _____ 12. Discussing research findings with your colleagues
- _____ 13. Writing for publication/presentation
- _____ 14. Leading a research team
- _____ 15. Designing a study
- _____ 16. Collecting data

APPENDIX D: RESEARCH TRAINING ENVIRONMENT SCALE – REVISED

Gelso, C. J., Mallinckrodt, B., & Judge, A. B. (1996). Research training environment, attitudes toward research, and research self-efficacy: The revised Research Training Environment Scale. *The Counseling Psychologist*, 24, 304-322.

Below are a series of statements concerning research training.

Please note: We define research broadly. "Research" when used in this survey includes the following types of activities: designing and executing research projects, preparing manuscripts of a theoretical nature or a critical review of literature, conducting program evaluations or needs assessments, making presentations at professional conferences, participating as a member of a research team engaged in any of the above activities, and advising the research projects of others.

Please respond to the following statements in terms of the doctoral program in which you are currently receiving your training. (Note: If you are currently on internship, please rate the graduate program in which you were previously trained.) If a question does not apply to you at this point in your program, please write "NA" for not applicable.

Consider each statement using the following scale: Please put the number chosen next to each question.

1	2	3	4	5
disagree	somewhat	neutral	somewhat	agree

1. In general, my relationship with my advisor is both intellectually stimulating and interpersonally rewarding. (If your advisor has been newly assigned or chosen, respond in terms of what you expect the relationship to be.) _____
2. My graduate program rarely acknowledges the scholarly achievements of students. ____
3. Many of our faculty do not seem to be very interested in doing research. ____
4. The faculty does what it can to make research requirements such as the thesis and dissertation as rewarding as possible. ____
5. The faculty here only seem to notice a few selected students in terms of reinforcing scholarly achievements. _____
6. My graduate program provides concrete support for graduate student research (e.g., access to computers, travel money for making presentations, research supplies, or free postage for mailing surveys). _____
7. I feel that my advisor expects too much from my research projects. _____
8. There is informal sharing of research ideas and feelings about research ideas in my program. _____
9. My advisor understands and accepts that any piece of research will have its methodological problems. _____
10. Faculty members often invite graduate students to be responsible collaborators in the faculty members' own research. _____
11. I was encouraged to get involved in some aspects of research early in my graduate training. _____

12. Because of the diversity of research approaches among faculty members in my program, I would be able to find help learning about virtually any major research approach, e.g., field, laboratory, experiential, qualitative, etc. _____
13. In my graduate training program there are opportunities to be part of research teams. _____
14. I have felt encouraged during my training to find and follow my own scholarly interests. _____
15. My training program faculty tends to produce research that is not clinically relevant. _____
16. The research climate here is one in which students can get in touch with their own curiosity and with the research questions they themselves want to ask. _____
17. Many different research styles (e.g., field vs. laboratory) are acceptable in my graduate program. _____
18. The faculty members of my graduate program enjoy discussing ideas. _____
19. Much of the research we become involved in prior to the thesis/dissertation is organized in a way that is highly anxiety provoking to students. _____
20. Students in my program receive sound training in how to design and logically analyze research studies. _____
21. I have gotten the impression in my graduate training that my research work has to be of great value in the field to be worth anything. _____
22. The faculty in my graduate training program is involved in the conduct and publication of high quality research (or theory). _____
23. Statistics courses here are taught in a way that is insensitive to students' level of development as researchers. _____
24. We do not receive sound training in my program on applied, practical, and less traditional approaches to research. _____
25. The statistics courses we take do a good job, in general, of showing students how statistics are actually used in psychological research. _____
26. There is a sense around here that being on a research team can be fun, as well as intellectually stimulating. _____
27. Students here are encouraged to at least begin thinking about one or more topics upon which they would like to conduct programmatic research (i.e., a series of studies in which one builds upon another). _____
28. My graduate training program has enabled me to see the relevance of research to clinical service. _____
29. The faculty members of my graduate program encourage me to pursue the research question(s) in which I am interested. _____
30. My advisor offers much encouragement to me for my research activities and accomplishments. _____

31. Faculty members in my program use an extremely narrow range of research methodologies. _____
32. In my research training, the focus has been on understanding the logic of research design and not just statistics. _____
33. Some of the faculty teach students that during a phase of the research process, it is important for the researchers to "look inward" for interesting research ideas. _____
34. Generally, students in my training program do not seem to have intellectually stimulating and interpersonally rewarding relationships with their research advisors. _____
35. It is unusual for first-year students in this program to collaborate with advanced students or faculty on research projects. _____
36. There seems to be a general attitude here that there is one best way to do research. _____
37. I have the feeling, based on my training, that my thesis (or dissertation) needs to be completely original and revolutionary for it to be acceptable to the faculty. _____
38. The faculty does not seem to value clinical experience as a source of ideas for research. _____
39. We get high quality training here in the use of statistics in applied research, e.g., counseling research. _____
40. I get the impression from my training that, although a single study does not revolutionize thinking in the scientific community, such a study can contribute a useful piece to an unfolding body of knowledge. _____
41. This training environment promotes the idea that although parts of research must be done alone, other parts may involve working closely with other colleagues. _____
42. Our statistics instructors are generally sensitive to students' anxieties and feelings about statistics. _____
43. Our faculty seems interested in understanding and teaching how research can be related to counseling practice. _____
44. Most faculty do not seem to really care if students are genuinely interested in research. _____
45. During our coursework, graduate students are taught a wide range of research methodologies, e.g., field, laboratory, survey approaches, etc. _____
46. During their first year in the program, students take a research course aimed at developing research skills, interests, and confidence. _____
47. I feel that I need to choose a research topic of interest to my advisor at the expense of my own interests. _____
48. There is a prevalent viewpoint in my training program that research findings can be used to improve clinical practice. _____

49. Students in our program feel that their personal research ideas are squashed during the process of collaborating with faculty members, so that the finished project no longer resembles the student's original idea. _____

50. Students here seem to get involved in thinking about research from the moment they enter the program. _____

51. Students in this program are rarely taught to use research findings to inform their work with clients. _____

52. The faculty members here are quite open in sharing their research with their students. _____

53. The faculty members of my graduate program show excitement about research and scholarly activities. _____

54. Much of the research we become involved in prior to the Thesis/dissertation is intellectually challenging and stimulating. _____

APPENDIX E: RESEARCH SELF-EFFICACY SCALE – REVISED

24. Be flexible in developing alternative research strategies. _____
25. Choose measures of dependent and independent variables. _____
26. Choose appropriate data analysis techniques. _____
27. Obtain approval to pursue research (e.g., approval from Human Subject's Committee/IRB, Animal Subject's Committee, special approval for fieldwork, etc.). _____
28. Obtain appropriate participants/general supplies/equipment. _____
29. Train assistants to collect data. _____
30. Perform experimental procedures. _____
31. Ensure data collection is reliable across trial, raters, and equipment. _____
32. Supervise assistants _____
33. Attend to all relevant details of data collection. _____
34. Organize collected data for analysis. _____
35. Use computer software to prepare texts (word processing). _____
36. Use computer software to generate graphics. _____
37. Use a computer for data analysis. _____
38. Develop computer programs to analyze data. _____

APPENDIX F: FEEDBACK FORM – DATA COLLECTION PACKET REVIEW

Please fill out the questions below. Your honest feedback is appreciated. If you need to use the other side of this form, please do so.

1) Ease of Instrumentation – how easy (user-friendly) were the survey instruments to complete?

2) Applicability – Did you find the questions on the instruments applicable to you?

3) Please comment on what you thought were the strengths of the instruments.

4) Please comment on area(s) of improvement with regard to the instruments.

5) If there is anything you would like to add, kindly do so below.

Thank you for your participation in this survey

**APPENDIX G: INQUIRY LETTER TO PROGRAMS REGARDING STUDY
PARTICIPATION**

Date:

Dear Dr. _____:

My name is Nicole Vaccaro and I am a Doctoral Candidate in the Counselor Education program at the University of Central Florida working under the supervision of faculty members, Glenn Lambie, Ph.D. and Dean Sandra Robinson, Ph.D. I will be conducting a study that investigates the relationship between research self-efficacy, perceptions of the research training environment, and interest in research of doctoral counselor education students. Published studies have explored these constructs with counseling psychology and clinical psychology doctoral students; however, this will be the first study to investigate these significant research constructs in doctoral counselor education students.

The primary purpose of this study is to investigate the impact of research interest and research training environment on counselor education doctoral students' levels research self-efficacy. The findings of this study will contribute to the limited research on counselor education doctoral students and may support counselor education doctoral preparation programs in their continuous development and effectiveness.

The participants of this study will be a national sample of first, second, third, and ABD counselor education doctoral students enrolled in CACREP accredited programs. Participants will be asked to complete four data collection instruments, which will take approximately 30 minutes total to complete. Participation in the study will be voluntary and the data anonymous. Prior to beginning this research, approval will be obtained from the IRB Committee of the University of Central Florida and my dissertation committee. Additionally, each participant will receive a \$1.00 incentive for participating, which will be included in the data collection packet. Once participants complete the data collection instruments, they will be mailed back to me via an enclosed self-addressed stamped envelope.

What I would like to ask, should your program choose to participate in this study, is for you to consider serving as a point of contact for your program. That would entail my mailing the packets of instruments to you (along with the IRB approval letter) so that students may pick them up from you.

Please let me know if your program would be willing to participate in this study.. Your timely response is greatly appreciated. I would appreciate your assistance in this research endeavor and feel the findings will contribute significantly to the counselor education literature. If you have any questions or concerns, please do not hesitate to contact me at the following telephone number and e-mail address: (407) XXX-XXX, XXX@yahoo.com

Thank you for your assistance.

Sincerely yours,

Nicole Vaccaro, MA.
Counselor Education Doctoral Candidate
University of Central Florida

APPENDIX H: PROGRAMS PARTICIPATING IN THIS STUDY AS OF 12/01/07

1. Auburn University
2. University of Northern Colorado
3. University of Florida
4. Idaho State University
5. Syracuse University
6. University of North Carolina – Greensboro
7. The Pennsylvania State University
8. University. of South Carolina
9. University of Tennessee
10. University of Virginia
11. Virginia Polytechnic University
12. University of Iowa
13. University of Wyoming
14. University of Akron
15. University of North Dakota
16. Northern Illinois University
17. Georgia State University
18. University of Arkansas
19. Southern Illinois University

APPENDIX I: PERMISSION LETTER

Permission to Use Chart in Dissertation

Dr. Nyquist:

Thank you for the permission to use the chart below. I used the chart to illustrate the points I was trying to make about the importance of the CID initiative in doctoral student education.

Best regards,

Nicole Vaccaro

Table 1. Contributions of Stakeholders (page 16)

-----Re:
Permission to utilize chart in article for dissertation purposes

Sunday, September 28, 2008 8:34 AM

Of course. Good Luck on completing your dissertation. Let me know how/why chart if being used.

Jody Nyquist

On Sat, 27 Sep 2008, Nicole Vaccaro wrote:
9/27/2008

> Dear Dr. Nyquist:

> I am writing to you to request permission to use (with proper citation) the table on page 16 of your publication below for my dissertation.

> Nyquist, Jody. (2002, November/December). The Ph.D.: A tapestry of change for the 21st century. *Change: The Magazine of Higher Learning*, 34 (6), 12-20.

> Please advise if this is okay.

> Thank you,

> Nicole Vaccaro
> Doctoral candidate
> Univ. of Central Florida

APPENDIX J: IRB APPROVAL



University of Central Florida Institutional Review Board
Office of Research & Commercialization
12201 Research Parkway, Suite 501
Orlando, Florida 32826-3246
Telephone: 407-823-2901, 407-882-2012 or 407-882-2276
www.research.ucf.edu/compliance/irb.html

Notice of Exempt Review Status

From: UCF Institutional Review Board
FWA00000351, Exp. 5/07/10, IRB00001138

To: Nicole Vaccaro and Glenn W Lambie

Date: January 16, 2008

IRB Number: SBE-08-05378

Study Title: **The Relationship between Research Self-efficacy, Perceptions of the Research Training Environment and Interest in Research in Counselor Education Doctoral Students: An Ex-Post-Facto, Cross-sectional Correlational Investigation**

Dear Researcher:

Your research protocol was reviewed by the IRB Chair on 1/16/2008. Per federal regulations, 45 CFR 46.101, your study has been determined to be **minimal risk for human subjects and exempt** from 45 CFR 46 federal regulations and further IRB review or renewal unless you later wish to add the use of identifiers or change the protocol procedures in a way that might increase risk to participants. Before making any changes to your study, call the IRB office to discuss the changes. **A change which incorporates the use of identifiers may mean the study is no longer exempt, thus requiring the submission of a new application to change the classification to expedited if the risk is still minimal.** Please submit the Termination/Final Report form when the study has been completed. All forms may be completed and submitted online at <https://iris.research.ucf.edu>.

The category for which exempt status has been determined for this protocol is as follows:

2. Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey or interview procedures, or the observation of public behavior, so long as confidentiality is maintained.
 - (i) Information obtained is recorded in such a manner that the subject cannot be identified, directly or through identifiers linked to the subject, **and/or**
 - (ii) Subject's responses, if known outside the research would not reasonably place the subject at risk of criminal or civil liability or be damaging to the subject's financial standing or employability or reputation.

A **waiver of documentation of consent** has been approved for all subjects. Participants do not have to sign a consent form, but the IRB requires that you give participants a copy of the IRB-approved consent form, letter, information sheet, or statement of voluntary consent at the top of the survey.

All data, which may include signed consent form documents, must be retained in a locked file cabinet for a minimum of three years (six if HIPAA applies) past the completion of this research. Any links to the identification of participants should be maintained on a password-protected computer if electronic information is used. Additional requirements may be imposed by your funding agency, your department, or other entities. Access to data is limited to authorized individuals listed as key study personnel.

On behalf of Tracy Dietz, Ph.D., UCF IRB Chair, this letter is signed by:

Signature applied by Janice Turchin on 01/16/2008 04:19:12 PM EST

LIST OF REFERENCES

- American Counseling Association. (2005). *ACA Code of Ethics*. Alexandria, VA: Author.
- American School Counselor Association. (2004). *Ethical standards for school counselors*. Alexandria, VA: Author.
- Bakeman, R. & Robinson, B. F. (2005). *Understanding statistics in the behavioral sciences*. Boston, Routledge.
- Baker, D. B., & Benjamin, L. T. (2000). The affirmation of the scientist-practitioner: A look back at Boulder. *The American Psychologist*, 55(2), 241-247.
- Baker, S. B., Exum, H. A., & Tyler, R. E. (2002). The developmental process of clinical supervisors in training: An investigation of the supervisor complexity model. *Counselor Education and Supervision*, 42, 15-30.
- Bakken, L., Sheridan, J., & Carnes, M. (2003). Gender differences among physician-scientists in self-assessed abilities to conduct clinical research. *American Medicine*. 78(12), 1281-1286.
- Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*, 84(2), 191-215.
- Bandura, A. (1986) *Social foundations of thought and action: A social cognitive theory*. Prentice-Hall: Englewood Cliffs, N.J.
- Bard, C. C., Bieschke, K. J., Herbert, J. T., & Eberz, A. B. (2000). Predicting research interest among rehabilitation counseling students and faculty. *Rehabilitation Counseling Bulletin*, 44, 48-55.

- Belar, C. D. (2000). Revealing data on education and training. *Clinical Psychology: Science and Practice*, 7, 368–369.
- Benjamin, L. T., Jr., & Baker, D. B. (2000). Boulder at 50: Introduction to the section. *American Psychologist*, 55, 233-236.
- Betz, N. (1997). Increasing research involvement and interests among graduate students in counseling psychology. *The Counseling Psychologist*, 25(1), 88-93.
- Bieschke, K. J. (2006). Research self-efficacy beliefs and research outcome expectations: Implications for developing scientifically minded psychologists, *Journal of Career Assessment*, 14, 77-91.
- Bieschke, K. J., Bishop, R. M., & Garcia, V. L. (1996). The utility of the Research Self-Efficacy Scale. *Journal of Career Assessment*, 4, 59-75.
- Bieschke, K. J., Bishop, R. M., & Herbert, J. T. (1995), Research interest among rehabilitation doctoral students. *Rehabilitation Education*, 9, 51-66.
- Bishop, R. M. & Bieschke, K. J. (1994). *Interest in Research Questionnaire*. Unpublished scale, The Pennsylvania State University.
- Bishop, R. M., & Bieschke, K. J. (1998). Applying social cognitive theory to interest in research among counseling psychology graduate students: A path analysis. *Journal of Counseling Psychology*, 45, 182-188.
- Black, L. L. (1998) The development and validation of the Mentor Functions Scale for Counselor Education. Ed.D. dissertation, University of Northern Colorado, United States -- Colorado. Retrieved on December 1, 2007, from Dissertations & Theses: Full Text database. (Publication No. AAT 9902403).

- Bogdan, R. & Biklen, S. (2002). *Qualitative research for education: An introduction to theory and methods* (4th ed.). Needham Heights, MA: Allyn & Bacon.
- Bonetta, L. (Ed.). (2004). *Making the right moves: A practical guide to scientific management for postdocs and new faculty*. Chevy Chase, MD: Howard Hughes Medical Institute and Burroughs Wellcome Fund.
- Bowman, S.L. (1997). Research training in counseling psychology: A former training director's perceptions. *The Counseling Psychologist, 25*, 82-87.
- Boyer, E. (1990). *Scholarship reconsidered: Priorities of the professoriate*. Baltimore: Carnegie Foundation.
- Briggs, C. (2006) Research mentorship in counselor education. Ph.D. dissertation, Oregon State University, United States -- Oregon. Retrieved March 10, 2008, from Dissertations & Theses: Full Text database. (Publication No. AAT 3214360).
- Brown, Steven D., Lent, R. W., Ryan, N. E., & McPartland, E. B. (1996). Self-efficacy as an intervening mechanism between research training environments and scholarly productivity. *The Counseling Psychologist, 24*, 535-544.
- Chwaliz, K. (2000) Evidence-based practice: A framework for twenty-first century scientist-practitioner training. *The Counseling Psychologist, 31*(5), 497-528.
- Clawson, T. W., Henderson, D. A., Schweiger, W. K., & Collins, D. R. (2004). *Counselor preparation: Programs, faculty, and trends* (11th ed). New York: Brunner-Routledge.
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Erlbaum.

Council for Accreditation of Counseling and Related Educational Programs (CACREP).

(2009) *The 2009 Standards*. Retrieved on October 29, 2008 from

<http://www.cacrep.org/2009Standards.html>

Cozby, P.C. (2001). *Methods in Behavioral Research*. New York, NY: McGraw Hill.

Cronan-Hillix, T., Gensheimer, L. K., Cronan-Hillix, W. A., & Davidson, W. S. (1986).

Students' views of mentors in psychology graduate training. *Teaching of Psychology, 13*, 123-135.

Dahl, T. I., Laeng, B., & Silvera, D. H. (2003). The training of doctoral students of psychology in the United States. *European Psychologist, 8*(1), 48-53.

Dillman, D. A. (2007). *Mail and Internet surveys: The tailored design method*. New York, NY: John Wiley and Sons.

Eisenhart, M., & DeHaan, R. L. (2005). Doctoral preparation of scientifically based education researchers. *Educational Researcher, 39*(4), 3-13.

Erwin, T. M. (2001). *Scholarship and counseling: A perfect marriage?* (Report No. CG031270). Washington, DC: U.S. Department of Education. (ERIC Document Reproduction Service No. ED45748).

Faghihi, F.Y. (1998). A study of factors related to dissertation progress among doctoral candidates: Focus on student research self-efficacy as a result of their research training and experience. *Dissertation Abstracts International, 59*(05), 1456A. (UMI No. AAG9834228).

Falvey, J. E. (1991). Rethinking research: Form and function in a clinical curriculum. *Journal of Mental Health Counseling, 13*, 221-235.

- Field, H. S. & Giles, W. F. (1980). Student satisfaction with graduate education: Dimensionality and assessment in a school of business. *Educational Research Quarterly*, 5, 66-73.
- Follette, V., & Klesges, R. C. (1988). Academic employment: A longitudinal study of the recruiting process and hired applicants. *Professional Psychology: Research and Practice*, 19(3), 345-348.
- Fong, M. L., & Malone, C. M. (1994). Defeating ourselves: Common errors in Counseling research. *Counselor Education and Supervision*, 33, 356-362.
- Forester, M., Kahn, J. H., & Hesson-McInnis, M. (2004). Factor structures of three measures of research self-efficacy. *Journal of Career Assessment*, 12, 3-16
- Fraenkel, J. R., & Wallen, N. E. (2006). *How to design and evaluate research in education*. Boston: McGraw-Hill.
- Friedlander, M. L., & Snyder, J. (1983). Trainees' expectations for the supervisory process: Testing a developmental model. *Counselor Education and Supervision*, 22, 343-348.
- Galassi, J. P. (1989) Maintaining the viability of counseling psychology: The role of research training. *Counseling Psychology Quarterly*, 2, 465-474.
- Geisler, C. C. (1995). Scientist-practitioner interests, research self-efficacy, perceptions of the research training environment and their relationship to dissertation progress. *Dissertation Abstracts International*, DAI-A 57/02 (UMI No. 9619812).
- Gelso, C. J. & Lent, R. (2000). Scientific training and scholarly productivity: The person, the training environment, and their interaction. In S. Brown & R. Lent (Eds.), *Handbook of counseling psychology* (3rd ed.) (pp. 109-139). NY: Wiley.

- Gelso, C. J. (1979). Research in counseling: Methodological and professional issues. *The Counseling Psychologist*, 8(3), 7-35.
- Gelso, C. J. (1993). On the making of a scientist-practitioner: A theory of research training in professional psychology. *Professional Psychology: Research and Practice*, 24, 468-476.
- Gelso, C. J. (2006). On the making of a scientist-practitioner: A theory of research training in professional psychology. *Professional Psychology: Research and Practice*, 24(4), 468-476.
- Gelso, C. J., Betz, N. E., Friedlander, M. L., Helms, J. E., Hill, C. E., Patton, M. J., Super, D. E., & Walpole, B. E. (1988). Research in counseling psychology: Prospects and recommendations. *The Counseling Psychologist*, 16, 385 - 406.
- Gelso, C. J., Mallinckrodt, B., & Judge, A. B. (1996). Research training environment, attitudes toward research, and research self-efficacy: The Revised Research Training Environment Scale. *Counseling Psychologist*, 24, 304-322.
- Glatthorn, A. (2002) *Publish or perish--the educator's imperative: Strategies for writing effectively for your profession and your school*. Corwin Press: California.
- Golde, C. M., & Walker, G. E. (Eds.). (2006). *Envisioning the future of doctoral education: Preparing stewards of the discipline*. San Francisco: Jossey-Bass.
- Golden, C.M. & Dore, T.M. (2001). At cross purposes: What the experiences of doctoral students reveal about doctoral education. Philadelphia, PA: A report prepared for The Pew Charitable Trusts. Retrieved on May 10, 2008 from (www.phd-survey.org)
- Granello, P. F., & Granello, D. H. (1998). Training counseling students to use outcomes research. *Counselor Education and Supervision*, 37(4), 224-237.

- Greeley, A. T., Johnson, E., Seem, S., Braver, M., Dias, L., Evans, K., Kincade, E., & Pricken, P. (1989). *Research Self-Efficacy Scale: Unpublished scale*. The Pennsylvania State University.
- Green, S. G., & Bauer, T. N. (1995). Supervisory mentoring by advisers: Relationships with doctoral student potential, productivity, and commitment. *Personnel Psychology, 16*, 537-561.
- Griffin, J. W., Hill, P. C., & McMinn, M. R. (2004). Satisfaction with research training in Christian psychology doctoral programs: Survey findings and implications. *Journal of Psychology and Christianity, 23*(4), 305-312.
- Heathcott, J. (2007). Blueprints, tools and the reality before us: Improving doctoral education in the humanities. Retrieved on November 3, 2007 from <http://www.carnegiefoundation.org/change/sub.asp?key=98&subkey=2438>
- Holden, G., Baker, K., Meenaghan, T. & Rosenberg, G. (1999) Research self-efficacy: A new possibility for educational outcomes assessment. *Journal of Social Work Education, 35*(3), 464-76
- Holland, J. L. (1978). *Vocational Preference Inventory*. Palo Alto, CA: Consulting Psychologists.
- Holland, J. L. (1985). *Making vocational choices: k theory, of vocational personalities and work environments*. (2nd ed.) Englewood Cliffs, NJ: Prentice-Hall.
- Hollingsworth, M. & Fassinger, R. (2002). The role of faculty mentors in the research training of counseling psychology doctoral students. *Journal of Counseling Psychology, 49*, 324-330.

- Hollingsworth, M. (2000). The role of research training environment, past research attitudes and mentoring relationships in predicting current research attitudes and behaviors. *Dissertation Abstracts International*, 59(5), 1456A. (UMI No. 9967916).
- Horn, R. A., Troyer, J. A., Hall, E. J, Mellott, R. N., Cote, L. S., & Marquis, J. D. (2007). The scientist-practitioner model: A rose by any other name is still a rose. *American Behavioral Scientist*, 50, 808-819.
- Jaccard, J. & Becker, M.A. (2002). *Statistics for the behavioral sciences* (4th ed.). Belmont CA: Thomson/Wadsworth.
- Jamieson, S. (2004) Likert Scales: How to (ab)use them? *Medical Education*, 38, 1217-1218.
- Johnson, B. (2001) Toward a new classification of non-experimental quantitative research. *Educational Researcher*, 30(2), 3-13.
- Jones, L. (2006). The role of faculty and peer research mentoring in research productivity, self-efficacy, and satisfaction of doctoral students. *Dissertation Abstracts International*, 67(09). (UMI No. 3234961).
- Joreskog, K. G., & Sorbom, D. (1993). *LISREL 8: Users' reference guide*. Chicago: Scientific Software International.
- Kahn, J. H. (2001). Predicting the scholarly activity of counseling psychology students: A refinement and extension. *Journal of Counseling Psychology*, 48, 344-354.
- Kahn, J. H., & Miller, S. A. (2000). Measuring global perceptions of the research training environment using a short form of the RTES-R. *Measurement and Evaluation in Counseling and Development*, 33, 103-109.

- Kahn, J. H., & Scott, N. A. (1997). Predictors of research productivity and science-related career goals among counseling psychology graduate students. *The Counseling Psychologist, 25*, 38-67.
- Kahn, J. H., Forester, M. & Hesson-McGinnis, M. (2004). Factor structure of three measures of research self-efficacy. *Journal of Career Assessment, 12*(1), 3-16.
- Kasser, T., & Ryan, R. M. (1996). Further examining the American dream: Differential correlates of intrinsic and extrinsic goals. *Personality and Social Psychology Bulletin, 22*, 280-287.
- Keuhl, R. O. (2000). *Design of experiments: Statistical principles of research design and analysis* (2nd ed.). Pacific Grove, CA: Duxbury Press.
- Kline, W., & Farrell, C. (2005). Recurring manuscript problems: Recommendations for writing, training, and research. *Counselor Education and Supervision, 44*, 166174.
- Kumar, R. (1999). *Research methodology: A guide for beginners*. London: Sage.
- Lambie, G. W., Sias, S. M., Davis, K. M., Lawson, G., & Akos, P., (2008). A scholarly writing resource for counselor educators and their students. *Journal of Counseling & Development, 86*(1), 18-25.
- Lambie, G. W. & Smith, H. L. (In review). Counseling students' levels of ego development, wellness, and psychological disturbance: Implications for counselor educators and supervisors. *Counselor Education & Supervision*.
- Landino, R., & Owen, S. (1988). Self-efficacy in university faculty. *Journal of Vocational Behavior, 33*, 1-14.

- Lark, J. S., & Croteau, J. M. (1998). Lesbian, Gay, and bisexual doctoral student's mentoring relationships with faculty in counseling psychology: A qualitative study. *Counseling Psychologist, 20*, 754-777.
- Lent, R. W., Brown, S. D., & Hackett, G. (1994) Toward a unifying social cognitive theory of career and academic interest, choice, and performance. *Journal of Vocational Behavior, 45*, 79-121.
- Leong, F. T. L., & Zachar, P. (1991). Development and validation of the scientist-practitioner inventory for psychology. *Journal of Counseling Psychology, 38*, 331-341.
- Likert, R. (1932). A technique for the measurement of attitudes. *Archives of Psychology, 140*, 55.
- Loughhead, T. (1991). Systematic approaches for research training: Benefits for counseling practice. *Journal of Mental Health Counseling, 13*(2), p. 270-278.
- Love, K. Bahner, A. Jones, L. & Nilsson, J. (2007). An investigation of early research experience and research self-efficacy. *Professional Psychology: Research and Practice, 38*(3), 314-320.
- Lundervold, D.A & Bellwood, M. F. (2000). The best kept secret in counseling: Single-case (large N=1) experimental design. In M.R. Jalngo, G.J. Gerlach, & W. Yan (Eds.). *Annual editions: Research methods* (p. 79-90) Guilford, CT: McGraw Hill/Dushkin.
- Magoon, T. M., & Holland, J. L. (1984). Research training and supervision. In R. W. Lent & S. D. Brown (Eds.), *Handbook of Counseling Psychology* (pp. 682-715). New York: Wiley.
- Mallinkrodt, B., Royalty, G.M., & Gelso, C.J. (1990). Impact of the research training environment and counseling psychology students' Holland Personality Type on interest in research. *Professional Psychology: Research and Practice, 21*(1), 26 –32.

- Marsh, H. W., & Craven, R. (1997). Academic Self-Concept. In G. D. Phye (Ed.), *Handbook of classroom assessment learning, achievement, and adjustment* (131-193). San Diego: Academic Press.
- McGrail, M., Rickard, C. & Jones, R. (2006) Publish or perish: a systematic review of interventions to increase academic publication rates. *Higher Education Research and Development, 25*(1), 19-25.
- Mertler, C. A. & Charles, C. M. (2008). *Introduction to educational research*. Pearson Education: Boston.
- Miller, H. H. (2006). An analysis of the relationship between the scholarly activity of counselor education doctoral students and intrinsic versus extrinsic goal aspirations. *Dissertation Abstracts International, 67*/08. (UMI No. 3230527).
- Moore, D. S., & McCabe, G. P. (2006). *Introduction to the practice of statistics* (5th ed.). New York, NY: W.H. Freeman and Company.
- Mulliken, E., Bakken, L. & Betz, N. (2007). Assessing research self-efficacy in physician-scientists: The clinical research appraisal inventory. *Journal of Career Assessment, 15*(3), 367-387.
- Nardi, P. (2003). *Doing Survey Research*. Allyn & Bacon: New York.
- Noe, R.A. (1988). An investigation of the determinants of successful assigned mentoring relationships. *Personnel Psychology, 41*,457-479.
- Nyquist, J.D. (2002). The Ph.D.: A tapestry of change for the 21st century. *Change, 34*(6), 12-20.

- O'Brien, K. M., Malone, M. E., Schmidt, C. K., & Lucas, M. S. (1998). *Research self efficacy: Improvements in instrumentation*. Poster session presented at the annual conference of the American Psychological Association, San Francisco.
- Okech, J., Astramovich, R., Johnson, M., Hoskins, W., & Rubel, D. (2006). Doctoral research training of counselor education faculty. *Counselor education and supervision*, 46(2), 131-145.
- Phillips, J. C. & Russell, R. K. (1994). Research self-efficacy, the research training environment, and research productivity among graduate students in counseling psychology, *The Counseling Psychologist*, 22(4), 628-641.
- Pietsch, J., Walker, R. & Chapman, E. (2003). The Relationship among self-concept, self-efficacy, and performance in mathematics during secondary school. *Journal of Educational Psychology*, 95, 589-603.
- Poidevant, J.M., Loesch, L.C. & Wittmer, J. (1991). Vocational aspirations and perceived self-efficacy of doctoral students in the counseling professions. *Counselor Education and Supervision*, 30, 289-300.
- Ramsey, M., Cavallaro, M., Kiselica, & M., Zila, L. (2002). Scholarly productivity redefined in counselor education. *Counselor Education and Supervision* (42)1, .40-57.
- Reisetter, M., Korcuska, J., Yexley, M., Bonds, D., Nikels, H. & McHenry, B. (2004). Counselor educators and qualitative research: Affirming a research identity. *Journal of Counselor Education and Supervision* 44(1), 2-16.

- Richardson, V. (2006). Stewards of a field, stewards of an enterprise: The doctorate in education. In C. Golde & G. Walker (Eds.), *Envisioning the future of doctoral education: Preparing stewards of the discipline* (pp. 251–267). San Francisco: Jossey-Bass.
- Robinson, E.H., (1994). Critical issues in counselor education research: Mentors, models and money. *Counselor Education and Supervision, 33*, 339-341.
- Royalty, G. M., & Magoon, T. M. (1985). Correlates of scholarly productivity among counseling psychologists. *Journal of Counseling Psychology, 32*, 458-461.
- Royalty, G. M., & Reising, G. N. (1986). The research training of counseling psychologists: What the professionals say. *The Counseling Psychologist, 14*, 49–60.
- Royalty, G. M., Gelso, C. J., Mallinckrodt, B., & Garrett, K. (1986). The environment and the students in counseling psychology: Does the research training environment influence graduate students' attitudes toward research? *The Counseling Psychologist, 14*, 9–30.
- SDS: Self-Directed Search* (4th ed.) (1994). Odessa, Florida: Psychological Assessment Resources, Inc.
- Shavelson, R. J., & Towne, L. (Eds.). (2002). *Scientific Research in Education*. Washington, D.C: National Research Council, National Academy Press.
- Shivy, V.A., Worthington, E.L., Birtel-Wallis, A. & Hogan, C. (2003). Doctoral research training environments (RTEs): Implications for the teaching of psychology. *Teaching of Psychology, 30*, 297-302.
- Shulman, L. S., Golde, C. M., Bueschel, A. C., & Garabedian, K. J. (2006). Reclaiming education's doctorates: A critique and proposal. *Educational Researcher, 35*(13), 25-32.

- Siebert, D. C. (2007). Maximizing response rates in survey research: Issues and methods. *Advances in Social Work, 7*(2), 1-13.
- Silvera, D.H., Laeng, B., and Dahl, T.I. (2003). The training of doctoral students of psychology in the United States. *European Psychologist, 8*, 48-53.
- Sprenkle, D. H. (2003). Effectiveness research in marriage and family therapy: Introduction. *Journal of Marital & Family Therapy, 29*(1), 85-96.
- Statistical Package for the Social Sciences, Windows Version 14.* (2005). Chicago: SPSS, Inc.
- Stewart, P. K., Roberts, M. C, & Roy, K. M. (2007). Scholarly productivity in clinical psychology Ph.D. programs: A normative assessment of publication rates. *Clinical Psychology: Science and Practice, 14*(2), 167-171.
- Stoltenberg, C.D., Kashubeck-West, S., Biever, J., Patterson, T. & Welch, I.D. (2000). Training models in counseling psychology: Scientist-practitioner versus practitioner-scholar. *The Counseling Psychologist, 28*(5), 622-640.
- Tabachnick, B. G., & Fidell, L. S. (2001). *Using Multivariate Statistics (4th ed.)*. Needham Heights, MA: Allyn and Bacon.
- Tang, M., Addison, K. D., LaSure-Bryant, D., Norman, R., O'Connell, W., & Stewart-Sicking, J. A. (2004). Factors that influence self-efficacy of counseling students: An exploratory study. *Counselor Education and Supervision 44*(1), 70-80.
- The Carnegie Foundation for the Advancement of Teaching*. Retrieved June 14, 2008 from <http://www.carnegiefoundation.org>
- Unrau, Y. & Beck A. (2004). Increasing research self-efficacy among students in professional academic programs. *Innovative Higher Education, 28*(3), 187-194.

- Weathers, P. L., Furlong, M. J., & Solórzano, D. (1993). Mail survey research in counseling psychology: Current practice and suggested guidelines. *Journal of Counseling Psychology, 40*(2), 238-244.
- Webb, K. (2005). Research interest in graduate psychology education as measured by Holland's vocational categories. *Dissertation Abstracts International DAI-B 66/03* (UMI No. 3168821).
- West, C. R., Kahn, J. H., & Nauta, M. M. (2007). Learning styles as predictors of self-efficacy and interest in research: Implications for graduate research training. *Training and Education in Professional Psychology, 1*, 174-183
- Williams, G. C., Cox, E. M., Hedberg, V., & Deci, E. L. (2000). Extrinsic life goals and health risk behaviors in adolescents. *Journal of Applied Social Psychology, 30*, 1756-1771.
- Wilson, R. (2001). A higher bar for earning tenure. *The Chronicle of Higher Education*, Retrieved on November 3, 2007 from www.chronicle.com
- Yee, L J. & Niemeier, D. (1996). Advantages and disadvantages: Longitudinal vs. repeated cross-section surveys. *Project Batelle, 94-16*.
- Zachar, P. & Leong, F.T.L. (2000). A 10-year longitudinal study of scientist and practitioner interests in psychology: Assessing the Boulder model. *Professional Psychology: Research and Practice, 31*(5), 575-580.
- Zimpfer, D. G., Cox, J. A., West, J. D., Bubenzer, D. L., & Brooks, D. K. Jr. (1997). An examination of counselor preparation doctoral program goals. *Counselor Education and Supervision, 36*(4), 318-332.

Zimpher, D. G. (1993). A comparison of doctoral graduates in counselor education and counseling psychology. *Counselor Education and Supervision*, 32, 227-240.