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Counselor Education Doctoral Students' Levels Of Research Self-efficacy, Interest In Research, And Research Mentoring: A Cross-sectional Investigation

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COUNSELOR EDUCATION DOCTORAL STUDENTS' LEVELS OF RESEARCH SELF-EFFICACY, INTEREST IN RESEARCH, AND RESEARCH MENTORING: A CROSS-SECTIONAL INVESTIGATION

by

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ABSTRACT

Doctoral counselor education programs are charged to develop effective researchers; however, limited investigations have examined research constructs in counselor educators-in-training. Therefore, this study will investigate a national sample of doctoral counselor education students' levels of research self-efficacy (*Research Self-Efficacy Scale*; Greeley, et. al 1989), interest in research (*Interest in Research Questionnaire*; Bishop & Bieschke, 1994), and research mentoring (*Research Mentoring Experiences Scale*; Hollingsworth & Fassinger, 2002). A cross-sectional, correlational research design will be used to test if doctoral counselor education students' year of preparation (1st, 2nd, or 3rd year) predicts their research self-efficacy, interest in research, and research mentoring scores. In addition, the study will investigate if doctoral students' research practices, (e.g., publishing refereed journal articles, presenting papers at national conferences) correlates with their levels of the three research constructs. Limitations and implications for the study will be discussed.

Keywords: counselor education and development, interest in research interest, research self-efficacy, research mentoring

This paper is dedicated to all mentors in every profession who have made a difference in the

lives of their protégés. It is also dedicated to the protégés with the hope that they pass on what

they have learned.

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CHAPTER ONE: INTRODUCTION

Research is an essential component of doctoral preparation programs. The Council for Accreditation of Counseling and Related Educational Programs (2009) states that "the importance of research in advancing the counseling profession" (Section II, G.8.a.) is important for training programs. In addition, the "Dissemination of research findings and sharing clinical perspectives are foundational to counselor education and in enhancing the profession of counseling" (Lambie, Sias, Davis, & Akos, 2008, p. 18). Research is both an expectation and a necessity for doctoral preparation of counselor educators.

Doctoral students who do not pursue careers as professional educators are still expected to be proficient at conducting research while in the doctoral preparation program (Love, Bahner, Jones & Nilsson, 2007). In addition to training counselor education doctoral students to be effective researchers, programs need to model research practices to students to support their development as independent researchers (Johnsrud, 1990). Nevertheless, counselor education doctoral students are viewed as less effective researchers as compared to professionals in related fields (e.g., counseling psychology; Altekruse, 1991). In other words, research is an expected part of study for the field of counselor education (Lambie & Vaccaro, 2011). Lanning (1990) suggested that counselor education and the field of psychology overlap but the perceived identity problem is due to the fact that the field of counseling is practiced by *master-level practitioners* whereas in the field of psychology, the majority of practitioners have a *doctorate degree*. The transition from doctoral student to counselor educator should be facilitated during the training environment, which is both a written and unwritten understanding (Rawls, 2008). The university training environment should include the discipline of training their students on being competent

researchers but graduate schools don't always provide the necessary training of their students (Lambie et al., 2008).

Doctoral counselor education students are expected upon graduation to be proficient in areas of teaching, supervision, research, and scholarly writing. CACREP (2009) states that "the use of research to inform evidence-based practice" (Section II, G.8.e.) is a principle expectation of such of an effective training program. Research is not restricted to doctoral level study but should also occur as well in master's level study (Huber & Savage, 2009) since training in universities include evidenced-based practices which highlight the necessity of having a research component as part of the curriculum. Not only does research add to the practice of counselor education but also to the practice of counseling as well (Heppner & Anderson, 1985). Lanning (1990) argued that research is important to counselor education but there is disconnect between research needed to drive the profession and actual research conducted.

The American School Counselor Association (ASCA 2010) *Ethical Standards for School Counselors* states that "Conduct appropriate research, and report findings in a manner consistent with acceptable educational and psychological research practices. School counselors advocate for the protection of individual students' identities when using data for research or program planning" (ASCA standard F.1.c). 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). Professional standards prescribe practices for preparation programs to include research training as part of the academic environment for future counselor educators. While research training is conducted throughout

many universities, mentoring environments of research training is not something that is readily fostered for doctoral students and junior faculty (e.g., Bard, Bieschke, Herbert, & Eberz, 2000; Borders et al., 2011; Briggs, 2006; Briggs, & Pehrsson, 2008; Golde, 2004; Jones, 2006; Kammeyer-Mueller & Judge, 2008; Lambie & Vaccaro, 2011; Okech, et al., 2006). , et al., 2006; Robinson III, 1994). The American Psychological Association (1952) stated that "An effective doctoral training program can be postulated only if one assumes that training is a process continuing throughout the counselor's professional career, and that the predoctoral program provides a base for the more specialized training that must follow" (p. 177). Nevertheless, limited research has investigated the development of research competencies within the field counselor education (e.g., Lambie & Vaccaro, 2011; Protivnak & Foss, 2009).

Counselor education preparation programs may not thoroughly prepare their students for their work as researchers (Lambie et al., 2008). The lack of research preparation for doctoral students can carry over to professional careers as counselor educators where junior faculty members are expected to produce caliber research and struggle to do so. Mentoring should not be limited to the doctoral experience but should continue within first year professional experience in order to ensure consistency with the counselor education (Borders et al, 2011; Kammeyer-Mueller, & Judge, 2008; Magnuson, Shaw, Tubin, & Norem, 2004).

In essence, it is their identity as researchers in the field of counselor education which is important to the mentoring process (Rawls, 2008; Reisetter, et al., 2004). The mentoring environment can be crucial to facilitating developing researchers (Eisenhart & DeHaan 2005; Kline & Farrell, 2005; Okech et. al., 2006); but it is not the lone factor. Additional factors need to be considered when examining students' self-efficacy as it related to research.

The Importance of Research

Research drives the professions of counseling and counselor education. Counselor education doctoral program ascribe to the scientist-practitioner model (also known as the Boulder method) in conducting research (CACREP, 2009). The scientist-practitioner model is the standard for practice in the industry of social science, which was developed in part as a request for the need of more psychologists following World War II (Benjamin & Baker, 2000; Baker & Benjamin, Jr., 2000). In order for scientist-practitioner model to operate effectively, there is the understanding that a mentoring relationship occurs within the confines of the training environment (Silvera, Laeng & Dahl, 2003). In order for the profession to grow, research on the practice needs to be conducted (Belar, 1998; Belar, 2000). Research on evidenced-based practices provides accountability for the profession of counseling (Granello & Granello, 1998).

The research environment is important for developing researchers and it is also important to understand internal structures that exist within each student. These contributing factors can be interest in research (Bieschke, Bishop, & Herbert, 1995) and the lack of research proficiency can be attributed to the counseling students not identifying themselves as researchers (Altekruse, 1991; Maples & Altekruse, 1993). Research self-efficacy is related to research productivity (Pasupathy, 2010). Students in doctoral programs who have come from practitioner backgrounds prior to reentering study as doctoral students tend to have a lack of interest in research (Anderson, & Heppner, 1985; Bieschke et al., 1995; Bishop & Bieschke, 1998; Lambie & Vaccaro, 2011; Rawls, 2008; Vaccaro, 2009). Heppner and Anderson (1985) recommend collaboration between the research environment and the practitioner environment in order to

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facilitate research in the field of counselor education. Essentially, research is an expectation of the training environment and also an expectation of the profession.

Scholarly Publication

Scholarly activity is important for new faculty to gain not only tenure and promotion but recognition as experts in their field. In addition, faculty members' scholarly productivity assists universities and their respective programs in obtaining funding to conduct further research (McGrail, Rickard, & Jones, 2006). Unfortunately, many counselor educator faculty members have limited research publications. Reasons cited for the lack of research in counselor education include: (a) insufficient time (Boice & Jones, 1984; Boice & Johnson, 1984); (b) lack of interest in doing research (Bieschke, Bishop, & Herbert, 1995; Boice & Jones, 1984; Robinson III, 1994); (c) not having appropriate mentoring during the research process (Borders, et al, 2011; Magnuson, Shaw, Tubin, & Norem, 2004; Niles, Akos, & Cutler, 2001); (d) recurrent manuscript writing problems (Kline & Farrell, 2005; Lambie et al., 2008); and (e) distractions, and the overall tediousness of writing (Boice & Jones, 1984). The expectancy of research for faculty and doctoral students is "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" (Vaccaro, 2009, p. 4). Research is a foundational tenet of both the graduate students in training and the existing faculty. Expectations are understood; however, in spite of the expectations and training, the proficiency of research by student graduates does not always match. Lambie and Vaccarro (2011) investigated 89 doctoral counselor education students from CACREP programs levels of research self-efficacy, perceptions of the research training, and interest in research and found that

doctoral students in their third year of preparation scored at higher levels research self-efficacy than first and second year students. In addition, they identified that 30.3 % of the participants published a manuscript in a refereed journal. Therefore, time in a doctoral counselor education program appears to increase students' level of research self-efficacy; however, only about a third of the students reported being successful in the scholarly writing process.

Research Self-Efficacy, Research Mentoring and Interest in Research

Research self-efficacy, research mentoring, and interest in research are significant constructs in the development of effective counselor education researchers. These three research constructs are described to set an accurate context for the study that follows.

Research Self-Efficacy

Self-efficacy has been defined by Bandura (1977) in his social cognitive theory as an opinion or decision making process (i.e., use of a judgment by the individual) of an individual's ability to perform some action. Belief and action go hand and hand. Bandura listed four sources of self-efficacy: (a) performance accomplishments, (b) vicarious experience, (c) verbal persuasion, and (d) emotional arousal. The first source of self-efficacy, performance, is based on actual experience while the other sources are more based on outside influences. Phillips and Russell (1994) contend that since research self-efficacy is complicated, the studies involving research self-efficacy should include a look at training environments and other factors such as psychological factors (e.g. anxiety) which may be contributory to students' levels of self-efficacy. Successful completion of research publications, doctoral dissertations and coursework leads to increasing research self-efficacy for students (e.g., Deemer, 2010; Senko, & Harackiewicz, 2005; Pajares, 1996; Varney, 2010). Student progress in research self-efficacy in

counseling is compounded due to the many demands placed on them to also be good teachers, therapists during their time as graduate students (Hill, 1997).

Bong and Skaalvik (2003) noted that self-efficacy serves as a foundation for self-concept in academic-related areas. Research self-efficacy is increased by a positive mentoring environment (Love, Bahner, Jones, & Nilsson, 2007). Bishop and Bieschke (1998) found that the factors of research self-efficacy and the mentoring environment had an effect on research interest. Another connection to research self-efficacy is interest in research (Bieschke, 2006; Bieschke, Bishop & Garcia, 1996; Bieschke, Bishop & Herbert, 1995). Kahn (2001) conducted a national survey of 149 counseling psychology students and found that with higher the levels of research self-efficacy, there was an increased involvement in conducting research and related activities. Research self-efficacy has been found to be a good predictor of student interest in conducting research and related activities (Bishop & Bieschke, 1998; Kahn & Scott, 1997; Lent, Lopez, & Bieschke, 1993; Lopez, Lent, Brown, & Gore, 1997). In addition, psychology students' research self-efficacy and research in interest scores predict their levels of scholarly productivity (Szymanski,Ozegovic, Phillips, & Briggs-Phillips, 2007). Therefore, counselor education doctoral students scoring at higher levels of research self-efficacy and interest in research likely will publish more scholarly works than students at lower levels of these two research constructs.

Self-efficacy is important to effective learning. Self-efficacy can be predictive of academic success when the tasks of interest are familiar to an individual. The greater students' self-efficacy beliefs are in learning, the more likely they will succeed in this endeavor and show an interest in educational-related activities even if the educational activity is very challenging (Bandura, & Barbaranelli, Caprara, & Pastorelli, 1996; Zimmerman, 2000).

Vaccaro (2009) investigated research self-efficacy with students from CACREP doctoral programs in Counselor Education. The study included mailing out 141 survey packets to the respective program coordinators of each CACREP program with a total of 89 responses to the survey. The results indicated that there was no significant statistical relationship between students perceptions of the training environment and research self-efficacy (i.e. the value for t (82) = -1.01, p = .318). The results did show a significant statistical relationship between interest in research and research self-efficacy. The study also reported that there were 69.7 percent of the participants (n = 59) reporting no scholarly activity, and had lower scores on research self-efficacy and interest in research than those who did report scholarly activity. Some doctoral students may already have high research self-efficacy prior to starting their graduate studies at the doctoral level. Students may have high self-efficacy in research identifying themselves as researchers, but then again, not all students do. Doctoral students might have prior research experience prior to engaging in their doctoral studies. These prior experiences can affect their own research self-efficacy which may have an impact on the type of mentoring relationship they have while they are a student (Gattis, 2008).

Rawls (2008) examined 577 Association for Counselor Education and Supervision (ACES) members' levels of research self-efficacy and research mentoring experiences of doctoral students in counselor education on occupational commitment. The results of the study indicated that 40% of the students reported they did not have a research mentor. It was also reported that positive research mentoring experiences was a strong predictor of research productivity.

Research Mentoring

Mentoring is a component of the training environment (Gelso & Lent, 2000; Hill, 1997; Hollingsworth & Fassinger, 2002). Gelso (1979) proposed a measure of the research training environment for graduate psychology students, suggesting that an effective training environment is enriching and also challenging for students where they could learn the necessary research skills and develop a greater interest in conducting research. Royalty, Gelso, Mallinckrodt, and Garrett (1986) studied the research training environment via administration and development of the Research Training Environment Scale (RTES), which included 358 participants from American Psychological Association (APA) graduate programs. The study results yield nine subscales which are listed here: (a) faculty modeling of appropriate scientific behavior, (b) reinforcement of student research, (c) early involvement in research, (d) untying of statistics and research, (e) facilitating students' "looking inward" for research ideas, (f) a concept of science as a partly social experience, (g) teaching that all experiments are flawed and limited, (h) a focus on varied investigative styles, (i) wedding of science and clinical practice, and (j) training needs to focus on how research gets done in agencies (p. 27). Further results indicated that students did not report significant changes in their research interest as they progressed in their training. The research training is important for graduate students as they progress throughout their graduate studies. The research training environment is important but the specific part of mentoring within that environment has a greater importance (Hollingsworth, 2000; Hollingsworth & Fassinger, 2002; Schlosser & Gelso, 2001).

The word mentor comes from a character the Greek playwright Homer discusses in his story the Odyssey. Mentor was appointed by Odysseus to be a guide for his son Telemachus while he was away fighting in the Trojan War (Wickman & Sjodin, 1997). Mentoring might be traced back to Greek mythology, but the methods of studying mentoring were not conducted until the 1970's (Black, 1998; Barondess, 1995). Black (1998) describes mentoring as "the act of two persons intentionally giving and receiving knowledge, support, trust, insight, and nurturance to each other over an extended period of time" (p. 1). Black further mentions that the mentoring process should be mutually beneficial for both parties involved. Mentoring is essential for student success as a graduate student and as their future role as professional educators (Gelso & Lent, 2000; Golde, 2008; Hill, 1997). Lark and Croteau (1998) provided a definition of mentoring which states that "Mentoring relationships are helping relationships between a student and a faculty person who possesses greater experience, influence or achievement" (p.758). Kram (1983) suggested that mentoring consists of two functions which are psychosocial and career. Although the definition of mentoring is difficult, the benefits of mentoring are invaluable and lead to successful career choices of the mentees (Gattis, 2008).

For the purpose of this study, the definition of mentoring will be defined as: "helping relationships between a student and a faculty person who possesses greater experience, influence or achievement. The primary purpose of the relationship is to assist and support the student in achieving long term broad goals (Lark, & Croteau, 1998, p. 758) and "includes any or all of three broad components: (a) emotional and psycho-logical support,(b) direct assistance with career and professional development, and (c) role modeling" (Jacobi, M. (1991).

Many graduate students feel that they will learn about how to be academics (e.g. being a teacher and researcher) through a mentoring relationship with respective faculty (Bieber & Worley, 2006; Black, 1998; Gelso, 1979). How important students view their mentoring relationship plays a pivotal role on how they view themselves as researchers (Black, 1998; Hollingsworth & Fassinger, 2002). Mentoring has several positive advantages for students including (a) students who stronger professional identities, (b) more scholarly activity, and (c) greater success in the completion of the dissertation (Clark, Harden, & Johnson, 2000).

Rawls (2008) utilized the RMES with a convenient sample of 577 student members of the Association for Counselor Education and Supervison (ACES) and found students who reported higher degrees of research self-efficacy reported lower research mentoring experiences with the inverse being true for students who reported lower degrees of research self-efficacy had higher research mentoring experiences. Positive mentoring experiences, according to Rawls, increases research self-efficacy. Rawls did not report a Cronbach's alpha in her study on the RMES.

Black (1998) investigated mentoring to validate the *Mentoring Functions Scale.* The study included 229 students doctoral students enrolled either on a full or part-time basis in counselor education in the United States. The reported Cronbach's alpha was .97. The author listed a four factor model "in which sponsoring, encouraging, teaching and counseling were identified as important functions (p. 68). The functions of Counseling/ Encouraging *(r = .85)*, Counseling/ Befriending *(r = .83)*, and Befriending/Encouraging *(r = .77)* had the highest correlations for the four factors.

Gattis (2008) studied mentoring 219 participants who were Doctoral level students. The study used "The Alleman Mentoring Activities Questionnaire (AMAQ) (Alleman & Clarke, 2002; reported Cronbach's alpha .98) and the Ideal Mentoring Scale (IMS; Rose, 2003; reported Cronbach's alpha .93). Results identified that the participants' view of what they received from their respective mentors was greater than the actual healthiness of the relationship itself. The difference between male and female participants was not reported to be significant.

Hollingsworth and Fassinger (2002) examined the RMES with 194 third- and fourth-year counseling psychology doctoral students. The authors reported a Cronbach alpha of .74 and found that students' mentoring experiences serve as good predictors for research behavior (i.e. scholarly publications, presentations, etc.). Students who reported positive mentoring experiences were more likely to engage in research activities.

Jones (2006) used the RMES with a sample of 121 counseling psychology doctoral students in their second year or later of an APA accredited program. Jones reported a Cronbach's alpha of .90 in this study for the peer research mentor version and .94 for the faculty research mentor version. The results of the study were that satisfying research mentoring experiences only predicted satisfactory graduate training and not research productivity.

Interest in Research

Bandura (1977, 1986) discussed his Social Cognitive Theory (SCT) when it is connected to learning. Essentially, it is the belief in the ability to complete a task fosters learning and commitment to the process. Individuals are more likely to show an interest in learning how to do something if they believe that they can be successful. Successful completion of education can be a function of students' beliefs that they can complete the educational tasks (Bandura, 1986). Bard

and colleagues (2000) put forward the thought that "Social-cognitive theory provides a useful framework for examining research interest" (p. 48) and that to fully understand interest in research, it is important to take in consideration that there is also a relationship between research interest, research self-efficacy and research outcome expectations. The outcome expectations are included in the belief system and can best be described that students believe their efforts will have good results, which will lead to successful projects. Students' interest in doing research is significant in leading them to careers that are research oriented (Royalty et al., 1986).

Bishop and Bieschke (1998) utilized the social cognitive model to study research interest with 184 doctoral students in counseling psychology programs throughout the United States. Instruments on research interest, training environment, research training environment, vocational preference and research outcomes. The results identified five factors that influenced research interest, which included: (a) research outcome expectations, (b) research self-efficacy, (c) Holland Investigative, (d) Artistic interests, and (e) age. Additional factors impacting doctoral students' levels of interest in research were their research training environment scores, investigative interests, and reported year in program.

Bard and colleagues (2000) investigated of factors that influence research interests of graduate students and faculty in the field of rehabilitation counseling in two studies. The first study involved 93 doctoral student participants and the second study contained 130 faculty members of master's and doctoral programs in rehabilitation. The participants were administered multiple instruments. Results identified that research self-efficacy was significant for faculty but not for students. Outcome expectations (i.e., what the students and faculty expected to gain, receive from research) was shown to be a predictor of research self-efficacy while research self-

efficacy did not show to be an indicator of interest in research. Many students only interest in doing research is solely for the purpose of completing their respective degree (Hill, 1997).

Phillips and Russell (1994) investigated the relationship between research self-efficacy, the research training environment, and research productivity within a sample of 125 graduate students in counseling psychology. The researchers used the *Research Training Environment Scale* (Royalty et al., 1986) and the *Self-Efficacy in Research Measure* (SERM), which was developed for this study. The results identified a positive relationship between research self-efficacy and the research training environment. Scholarly activity is understood to be part of the training environment but proficiency is not always attributed to interest or mentoring but length of time that students engage in research activities.

Miller (2006) investigated doctoral students' ($N = 103$) scholarly activity and their respective career aspirations within a sample in CACREP accredited and non-CACREP accredited programs. The two dependent variables examined were (a) frequency of scholarly activity and (b) importance of scholarly activity. The dependent variables were compared against the variables of length of time in doctoral program, intrinsic and extrinsic goal aspirations and the social context of doctoral programs. Results supported that scholarship activity was related to length of time in program and social contexts in the doctoral program. While length of time in a program can impact research self-efficacy, so can the type of research that the students are engaged in.

The type of research (qualitative vs. quantitative) can also determine research efficiency. Some doctoral student wishing to engage in qualitative research might have faculty mentors not well versed in this area. Okech et al. (2006) surveyed 167 faculty members in CACREP

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accredited programs and found that faculty who had graduated from different time periods (e.g., 1970's, 1980's, etc.) had different views on qualitative versus quantitative research. The reported findings where that faculty who had attended graduate training in the 1970's and 1980's reported that qualitative research was rarely mentioned during their training and what they learned about it was more from being self-taught. Faculty in the study who were trained in later decades reported higher levels of qualitative research preparedness. Okech et al. (2006) reported that there was a consistency from all participants (regardless of decade of study) reporting a need for research-specific mentoring. In addition, they found that counseling graduate students reported higher quality of their training environment when they had been able to have more presentations at conferences and more research publications.

The educational processes within doctoral preparation are complex (Jenkins, 2010). Acquiring the necessary skills to become proficient in research and other areas is more than just sitting in a classroom or learning from a book. There is a developmental component within this training includes the piece of mentoring and fostering, the process improves for the students. Silvera, Laeng, and Dahl, (2003) contend that mentoring helps booster self-confidence Students who feel confident about what they are doing are more likely to perform better. A problem that can occur in the mentoring environment is the interactions that students have with faculty members not only differ between themselves and the faculty members, but they also differ among their peers

The research mentoring environment is crucial in facilitating success for their graduates at the next level (Altekruse, 1991; Maples, 1989; Maples & Altekruse, 1993). The mentoring experience is important for students' development as scholar-research, and includes the

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mentoring process as a socialization of students where they learn how to be faculty. The process is *not* just the responsibility of the mentor but of the student as well (Luna & Cullen, 1998; Rosser, 2004). Doctoral students tend to rate their respective mentoring experiences as being more important than their personal research self-efficacy (Rawls, 2008); even though there is the possibility that the mentoring experiences relationship to research self-efficacy may not exist (e.g., Vaccaro, 2009). Predicting student self-efficacy cannot be done solely by examining research self-efficacy; other factors that can contribute to making a prediction.

Cronan-Hillix, Gensheimer, Cronan-Hillix and Davidson, (1986) investigated mentoring in a 90 graduate psychology students, using the 40-item survey questionnaire developed to ask the students questions related to (a) whether they had a mentor or not, (b) common characteristics of mentors, (c) the role they feel that the mentor has for them as a graduate student, and (d) what their respective mentoring experiences were like. The study had 53% of the participants reporting that they had a mentor. Of the students who had reported having a mentor, 80% of them reported involvement with a mentor who had similar interest. Results identified that mentoring promotes research productivity if it is done earlier in the students' development as a graduate student. The later the mentoring relationship occurs; research productivity on the part of students tends to go down. There are several elements that can facilitate the possibility of future research. While time in a program may affect the mentoring relationship, the characteristics of the mentor can also affect the mentoring relationship for how graduate students choose their ideal mentor.

Rose (1999) designed a scale to measure graduate students definition of an ideal mentor as measured by the *Ideal Mentor Scale*. The study involved administering the instrument to two different Research 1 Universities ($n = 250$ and $n = 380$ respectively). The results showed that the students reported that their ideal mentor would be their major professor or primary research advisor. The majority of the participants did not show a gender preference for their ideal mentor.

Good predictors of future research of students are related to: (a) students' self-efficacy (Lambie & Vaccaro, 2011); (b) amount of time spent in graduate training (Miller, 2006); and (c) research mentoring experiences which include the research environment and research training experiences (e.g., Cronan-Hillix, Gensheimer, Cronan-Hillix & Davidson, 1986; Galassi, Stoltz, Brooks, & Trexler, 1987; Hollingsworth & Fassinger, 2002; Krebs, Smither, & Hurley, 1991; Phillips & Russell, 1994). In order for students to have successful academic careers following their graduate training, research productivity is an essential element of this process (Atieno Okech, Astramovich, Johnson, Hoskins, & Rubel, 2006; Smaby & Crews, 1998). While it is recognized that the research environment is pivotal for future success of graduate students, it is not always being looked at from a research perspective.

There is a limited research activity in counselor education programs (Briggs, 2006; Miller, 2006). Research is an essential component for programs who wish to adhere to the CACREP (2009) standards. Programs who are CACREP accredited do not always foster the identity of their students to be researchers (Reisetter et al. 2004). The standards of the industry are not being supported by what the literature says. The counselor education literature is limited with respect to research on mentoring environment, interest in research, and research self-efficacy concerning counselor education doctoral students (Briggs, 2006; Lambie & Vaccaro,

2011; Miller, 2006). The revelation in the literature that the programs are not providing a research-rich environment is a growing area of concern. Some of that concern is attributed to the university programs themselves adhering to models that are insufficient to address the different research area types. Mentoring is instrumental for success at the next level (Eisenhart & DeHaan. 2005: Kline & Farrell, 2005; Atieno-Okech, et al. 2006). The characteristics of the mentors can also influence how students choose their respective mentors (Rose, 1999). There are several factors that can affect students' interest in research and research self-efficacy. Understanding counselor education students is not enough to be able to encourage them to recognize the importance of research.

Many students who embark on becoming counselor educators or even practitioners after graduation fail to recognize the importance of using revealed research as part of their practice (Granello & Granello, 1998). Doctoral students generally place a greater emphasis on practicum and counseling experiences than they do other academic activities such as research (Zimpfer, Cox, West, Bubenzer, & Brooks Jr. 1997). The failure to recognize the importance of research can contribute to the identify problem of doctoral students seeing themselves as researchers (Rawls. 2008). Students who don't see the value of research and identify themselves as capable researchers are more than likely not going to engage in research activities (Lambie & Vaccaro, 2011; Rawls, 2008). In order for students to have success at the next level which includes being a competent and quality researcher (Follette & Klesges, 1988), it is imperative that universities have training that is structured with courses that support writing (McGrail, Rickard & Jones, 2006) with the overall environment that emphasizes the importance of research and training (Follette & Klesges, 1988; McGrail, Rickard & Jones, 2006, Zimpher, Cox, West, Bubenzer, &

Brooks, 1997). What is of upmost consideration is that universities who are accredited by CACREP take necessary steps to ensure that their students are being adequately trained to conduct excellent research to add to the field of knowledge. In order to gain an understanding of what is necessary to improve training, it has to be evaluated and studied.

The purpose this study was to examine the relationship between research self-efficacy (as measured by the *Research Self-Efficacy Scale*; Greeley et al., 1989), research mentoring (as measured by the *Research Mentoring Experiences Scale*; Hollingsworth & Fassinger, 2002), and interest in research (as measured by the *Interest in Research Questionnaire*; Bishop & Bieschke, 1994) within a national sample of doctoral counselor education students in CACREP accredited programs. The study examined the relationship between the reported demographic information of the participants and the three research constructs of interest. The rationale for the investigation contributes to the literature of counselor education on developing training and mentoring environments that promote student development and give confidence to these students in order for them to be effective researchers. The study was intended to address the present void in the counselor education literature that deals with counselor education doctoral students' development in the areas of (a) research self-efficacy, (b) students' perceptions regarding their mentoring environment, and (c) doctoral students interested in conducting research.

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*), interest in research (as measured by the *Interest in Research Questionnaire*), and research mentoring (as measured by the *Research Mentoring Experience Scale*) of a national sample of doctoral counselor education students

enrolled in CACREP institutions. The intent of the study was to add to the limited literature on doctoral student mentoring in counselor education training programs and how mentoring impacts research interest and research self-efficacy. In addition, the study addressed the limited research in counselor education with respect to student development in research self-efficacy, interest in research and research mentoring experiences. Furthermore, the findings provided data that can support counselor education doctoral students preparation to become stronger scholar-researchers.

Definition of Terms

The following section defines the terms of interest for this proposed study.

Doctoral Counselor Education Programs – the doctoral counselor education programs are defined as those programs that are designed to train doctoral students in how to be proficient scientist-practitioners. The scientist portion of this definition is further defined as the researcher. The practitioner portion of this definition is further defined as teacher, counseling practitioner and counseling supervisor. The study examined only those programs that are Council for Accreditation of Counseling and Related Educational Programs (CACREP, 2009) accredited.

Doctoral Counselor Education Students – the doctoral counselor education students are the subject of interest in the study. For the purpose of this study, they are defined as those students who are enrolled in CACREP (2009) accredited doctoral counselor education programs. The students are further defined as (a) 1st year Doctoral student; (b) 2nd year doctoral student, and (c) 3rd year (and beyond) doctoral student.

Interest in Research – interest in research is being defined as a person (or persons) that has/have an interest in conducting research and will engage in research-related activities. These activities can include publications in national refereed journals and conferences on area of expertise. Conferences can be either at the National, International or local level; which is essential for counselor education students' professional identity development (Bishop & Bieschke, 1998).

Research Self-efficacy – research self-efficacy takes Bandura's (1977) definition of self-efficacy of belief of self to perform an action. Research self-efficacy is thus defined as one's confidence in being able to successfully complete various aspects of the research process. The research process is any research-related activities.

Research Mentoring Experience (RME) – the study defines the Research Mentoring Experience (RME) as the process by which a more experienced person works closely with less experience in order to facilitate skill development in research and scholarly work. The more experience individual serves as a mentor and role model. The mentor provides knowledge and advice and is both challenging and supporting of the mentee (Anderson, & Shannon, 1988; Clark, Harden, & Johnson, 2000; Dohm & Cummings, 2002; Rose, 1999).

Scholarly Activities – scholarly activity refers not just to publication in peer-refereed journals but also to other forms of scholarly activity such as grant writing, conference presentations (e.g. national, international and local presentations) and chapters in books. Ramsey, Cavallaro, Kiselica, and Zila (2002) defined scholarly activity in seven categories, which include: (a) journal articles; (b) conference presentations; (c) other published works (e.g. books);

(d) scholarly works pertaining to teaching; (e) other professional activities (e.g. workshops, consultations); and (f) professional leadership roles (e.g., serving on a professional board).

Scholarly Research Publications – scholarly research publications refers to publications in peer-reviewed journals at the national, international and state levels and local level.

Self-efficacy – self-efficacy is defined from Bandura's (1977) as the belief of self in the ability to perform an action. A student is a good researcher based on the belief that they can be good researchers.

Research Design & Methodology

The study employed a correlational design to examine the relationship between variables. A correlational design helps to demonstrate the strength of the relationship between two variables and if the values of those variables vary in strength with reference to the variable it is being compared to (Greasley, 2008). Lambie, Smith, and Ieva (2009) stated that "a descriptive, correlational design does not infer causal relationships and is, therefore, more conducive to purposive sampling" (p.120). The researcher is interested in investigating the relationship between research self-efficacy, research mentoring, and interest in research in counselor education doctoral students. It is suitable to use a correlational design for the study since all the variables in the study are continuous making it possible to examine a relationship and look for causality. Categorical variables do not allow for cross-sectional relationships but instead allow for associations (Rumsey, 2003).

The study defined research self-efficacy as the dependent variable and the independent variables were interest in research and the research mentoring environment. The rationale for choosing self-efficacy as the dependent variable was related to the researcher's interest in

determining if the research mentoring experience and interest in research are predictors of research self-efficacy. The researcher is interested to see if there is a relationship between the three variables of the research training environment, interest in research and research self-efficacy.

The dependent variable (research self-efficacy) and independent variables (interest in research and research mentoring experience) were examined for variations that might exist in counselor education doctoral students in second and third year (and higher) as compared to doctoral students in their first two semesters of study. The study used an ex-post factor; cross-sectional research design (Montero & León 2007) to conclude if a difference between the groups exists. Ex-post facto design is used to examine if there were preexisting conditions that may not have been accounted for in the original design that may cause consequent differences of the groups. Ex post facto causes are studied after they presumably have "exerted their effect on the variable of interest" (Gall, Gall, & Borg, 2007, p. 639). Another aspect of ex post facto research is it "seeks to describe the relationships between variables" (Oyster, Hanten, & Llorens, 1987, p. 87). Cross-sectional research designs, data is obtained from groups that are in different stages of development (Gall et al., 2007). The cross-sectional design is intended to look at the differences between 1st, 2nd, and 3rd and beyond doctoral students of the three variables of research self-efficacy, research interest, and research mentoring.

Instrumentation

The study included the collection of four data measurements. The data measurements served as the essential method to test the relevant research questions and corresponding hypotheses. These four instruments will include: (a) Demographic Questionnaire; (b) *The*

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Research Self-efficacy Scale (RSES); (c) *Interest in Research Questionnaire* (IRQ), and (d)

Research Mentoring Experiences Scale (RMES). Each data collection instrument is described

next. The instruments utilized were Likert scale or a Likert-type item (Ary, Jacobs & Sorenson,

2010). The RMES and IRQ are Likert scale instrument and the RSES is a Likert-type instrument.

General Demographic Questionnaire. The demographic information sheet was a one-page

document intended to solicit responses from the participants. The demographic sheet were asked

information that pertains to age, gender, race/ethnicity, year in program (e.g., first year, second

year, third year or further), location (i.e. where in the United States their respective program is

located), professional or career aspirations (i.e. plans beyond training environment with regards

to being in academia or private practice), area of specialization, total number of doctoral-level

research courses taken, and professional activity (i.e. total number of publications in refereed

journals, conferences and presentations, etc.).

     The Research Self-efficacy Scale. The *Research Self-efficacy Scale* (RSES; Greeley et

al., 1989) consists of 38 items designed to measure an individual's perceived ability to perform

various research tasks. The value for the respective items range from 0 (not confident) to 100

(totally confident). The items question areas of research-related activities. An example of these

items are developing an appropriate research design, organize writing (manuscript) that is related

to the research. The instrument was developed by Holden, Barker, Meenaghan, and Rosenberg

(1999) who reported Cronbach's alphas of .94 at both pre-test and post-test. Bieschke, Bishop

and Garcia (1996) and Bieschke et al. (1995) reported a high internal consistency for the RSES

being .96. Holden, Barker, Meenaghan, and Rosenberg (1999) reported an internal consistency

of .94. Lambie and Vaccarro (2011) reported overall alpha coefficient score of .96. Forester,

Kahn, and Hesson-McInnis (2004) completed a factor analysis on the RSES with 1,004 participants using a web-based survey. Love, Bahner, Jones, and Nilsson, (2007) reported an alpha coefficient of .96. and found that positive peer research experiences contribute to research self-efficacy. Unrau and Beck (2004) conducted a study evaluating increase in research self-efficacy with 60 Social Work students and 75 Speech-Language Pathology students. The study was designed as a pre and post-test to examine whether or not students' scores increased on the RSES after having research and practice courses compared to students taking practice courses alone. They found that students who were provided both research and practice courses had greater increases in the RSES than those students who had practice courses alone.

Interest in Research Questionnaire. The *Interest in Research Questionnaire* (IRQ; Bishop & Bieschke, 1994) is a 16-item scale designed to look at different research activities. The instrument items are a five point scale starting from 1 (very disinterested) to 5 (very interested) to gauge the degree of interest in a particular research task (e.g. performing and developing research design; completing comprehensive literature reviews). Bishop and Bieschke, (1994) reported an internal consistency of .89 while Bieschke et al. (1995) reported a .90. Jones (2006) studied faculty and peer research mentoring, mentoring in research productivity, self-efficacy, and satisfaction of doctoral students within a sample of 43 counseling psychology doctoral students from APA programs. Jones reported a Cronbach's Alpha of .94 for the study. Bard, Bieschke et al. (2000) studied interest in research using the IRQ and identified internal consistency of .90). The Bishop et al. (1994) study examined faculty members as well as students. They found that students' beliefs of research self-efficacy were not related to research interest. Lambie and Vaccaro (2011) reported a Cronbach alpha of .93. Other studies such as

Jones (2006) and Love, Bahner, Jones, and Nilsson (2007) have utilized the IRQ and reported it

being a sound instrument in measuring this construct. Love et al. (2007) conducted a study of

whether or not early research experience is a factor that improves research self-efficacy for

students. They reported a Cronbach's alpha of .93. The results of the study found that supportive

peers and mentors was a contributory factor.

   Research Mentoring Experiences Scale The *Research Mentoring Experiences Scale*

(RMES; Hollingsworth & Fassinger, 2002) is a 29-item scale used to measure the mentoring

experiences of doctoral students education. The RMES was based on two similar instruments

used in business settings. The RMES contains two subscales: Psychosocial Mentoring and

Career Mentoring. The RMES was initially tested and revised in a pilot study. The authors

reported an internal consistency of .74. Although the authors reported a high internal

consistency, "the data generated concerned the researchers as the instrument did not have an

established record of validity and reliability in the literature" (Vaccaro, 2009, p.13). The reported

consistency of this instrument is relatively high but a limitation exists since it is not well

documented in the literature regarding its usage. Rawls (2008) utilized this instrument in her

study but did not report any additional statistics (i.e. internal validity, factor analysis). Jones

(2006) used the RMES and reported a Cronbach's alpha of .90 in this study for the peer research

mentor version and .94 for the faculty research mentor version.

Research Questions and Hypotheses

Research Question 1

Do doctoral counselor education students' levels of research self-efficacy (as measured by *The Research Self-efficacy Scale*) predictor their research mentoring (as measured by the *Research Mentoring Experiences Scale*) and interest in research (as measured by the *Interest in Research Questionnaire*) scores?

Research Null Hypothesis 1

Interest in research (as measured by the *Interest in Research Questionnaire* [IRQ]) and perceptions of research mentoring (as measured by the *Research Mentoring Experiences Scale* [RMES]) do not predict counselor education doctoral students' reported research self-efficacy (as measured by the *Research Self-efficacy Scale* [RSES]).

Research Question 2

Does doctoral counselor education students' year of preparation (1st year, 2nd year, and 3rd year) predict their levels of research self-efficacy (as measured by *The Research Self-efficacy Scale*), interest in research (as measured by the *Interest in Research Questionnaire*), and research mentoring (as measured by the *Research Mentoring Experiences Scale*)?

Research Null Hypothesis 2

No statistically significant difference exists among counselor education students based on their year of preparation (1st year, 2nd year, and 3rd year and beyond) with respect to their scores in research self-efficacy (as measured by the *Research Self-efficacy Scale-Revised* [RSES-R],) interest in research (as measured by *Interest in Research Questionnaire* [IRQ]), and research mentoring (as measured by the *Research Mentoring Experiences Scale* [RMES]).

Research Question 3

What is the relationship between research self-efficacy (as measured by The *Research Self-efficacy Scale*), interest in research (as measured by the *Interest in Research Questionnaire*), and research mentoring (as measured by the *Research Mentoring Experiences Scale*) 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

Counselor education doctoral students' do not differ in research self-efficacy (as measured by the *Research Self-efficacy Scale*), reported interest in research (as measured by the *Interest in Research Questionnaire*), and perceptions of research mentoring (as measured by the *Research Mentoring Experiences Scale*) with respect to various demographic variables (i.e.., age, gender, scholarly activity, specialization, doctoral-level research courses taken, and professional aspirations, etc.)

Research Question 4

Is the relationship observed of the effect of research mentoring (as measured by the *Research Mentoring Experiences Scale*) on research self-efficacy (as measured by the *Research Self-efficacy Scale*) improved using structural equation modeling due to its correction for measurement error in the instruments?

Research Null Hypothesis 4

The results of the structural equation modeling does not improve the relationship of research mentoring (as measured by the *Research Mentoring Experiences Scale*) on research

self-efficacy (as measured by the *Research Self-efficacy Scale*) due to its correction for measurement error in the instruments.

Population & Sampling

A purposive sampling plan was used and allowed the researcher to obtain much more information from that other sample procedure can't obtain plus it allows for the collection of larger sample sizes in shorter periods of time (Trochim & Donnelly, 2008). To determine an appropriate sample size, numerous factors need to be considered, including power of the study, the effect size of the study and the level of significance. The power of the study is the measurement of rejecting a false null hypothesis or not committing a type II error (Lomax, 2007). A power of 80% would be the minimum required to avoid this type of error (Cohen, 1992b). The effect size would be determined to be a medium effect size of ($f = .35$). The study employed an alpha level of (.05), which is common in social sciences research. Using a medium effect size (power = .80), with three independent groups, the minimum number of subjects needed for this effect size would be 76 for a test of independent means (Cohen 1992a). According to Holbert and Stephenson (2002), there are no hard and fast rules when it comes to sample size in structural equation modeling (SEM). Holbert and Stephenson contend that larger sample sizes are needed in more robust studies. Weston, Gore, r. (2006). recommend at least 200 subjects to run any SEM procedure. The present study contained 261 participants. Response rates for survey instruments with counselor education students are appropriately 50% (e.g., Kahn & Scott, 1997; 55% reported; Vaccaro, 2009 [63.1% reported]); therefore, a minimum of 200 counselor education doctoral students will be invited to participant in the proposed investigation.

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Data Collection Procedures

The participants for this study were counselor education doctoral students. Forty-six CACREP programs were contacted to participate in the study following IRB approval. Following IRB approval, the population targeted was students enrolled in CACREP accredited programs nationwide, including students in their first, second, and third year (or higher) of doctoral preparation. The program coordinators for each respective program were contacted. A purposive sampling plan was implemented, allowing researcher to obtain much more information that other sample procedures can't obtain plus it allows for the collection of larger sample sizes in shorter periods of time (Trochim & Donnelly, 2008).

Program coordinators (or appointed representative) were contact to request access to the potential participants. A cover letter explaining the purpose of the study and a letter of informed consent was enclosed (letter will inform prospective participants that receipt of survey packets will be sufficient 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 Mentoring Experiences Scale* (RMES; Hollingsworth & Fassinger, 2002) and (c) *Research Self-efficacy Scale* (RSES; Greeley et al., 1989). The researcher will utilize Dillman et al. (2009) survey methods for contacting potential participants. The research also utilized Listserve as additional method to contact potential participants. Self-addressed envelopes were included in the packets to mail the completed forms back to the researcher. A one Dollar bill was attached to the survey packets as an incentive for completing the survey instruments. Dillman et al (2009) survey methodology (i.e. multiple contacts) was

used to ensure appropriate response rate. A deadline of March 1, 2012 was requested to ensure instruments were received in order to begin data analysis.

Data Analysis Procedures

The study employed a cross-sectional, correlational research design. The data packets were collected from each participating CACREP program and reviewed for completeness (i.e., completed survey packets and corresponding demographic sheets). Following review of data packets for completeness, any unusable packets were discarded (i.e., not included in the data analysis). Useable packets were inputted into SPSS 17.0 (2009). The data analysis involved three statistical procedures. The separate statistical procedures were used to answer each research question. The present study includes administration of both mailed survey packets and electronic survey packets. The combination of survey administration methods was to comply with the CACREP doctoral program coordinators' who requested electronic submission. The data packets received from the mailed packets were compared to the electronic survey packets.

To answer research question one, multiple linear regression (MLR) was used. MLR allows for simultaneous testing and modeling of multiple independent variables (Moore & McCabe, 2006). The data analysis MLR uses will use two statistical procedures, which include Pearson's correlation coefficients (two-tailed) and analysis of variance (ANOVA) Pearson's correlation coefficients was utilized in order to determine whether there was a statistically significant relationship between the research self-efficacy, the research mentoring experience, and the interest in research variables. Pearson product correlations are appropriate to use in this type of analysis since one of the variables is continuous (Gliner & Morgan, 2000). A multiple regression procedure was utilized to determine if there is a significant relationship between the

constructs of research self-efficacy, interest in research, and the research mentoring experience. MLR is a "correlational procedure that examines the relationships among several variables. Specifically, MLR enables researchers to find the best possible weighting of two or more independent variables to yield a maximum correlation with a single dependent variable" (Ary, Jacobs, & Sorenson, 2010, p. 360).

An ANOVA will be used to answer research questions two. The variables in the analysis are continuous dependent variables and categorical independent variables (Field, 2005). Regarding research question number two, the researcher is interested in the difference that exists between groups (i.e. year of preparation). ANOVA procedures are appropriate when making group comparisons (Gall, Gall, & Borg, 2007). For research question number three, the dependent variables included research self-efficacy, perceptions of research mentoring, and interest in research; while the independent variables were the demographic variables of gender, age, race, years of postgraduate experience, and scholarly activity and prior mentoring experience. MLR was used to evaluate research question number three. Since the analysis involves categorical variables as predictors, the variables are recoded in dummy variables (Field, 2005). MLR procedures typically do not use dichotomous (or categorical variables) variables as predictors but continuous variables (Boniface, D.R. (1995; Sproull, N. L. (1995). To determine whether there was a difference between participants' gender, age, race, scholarly activity and years of post-graduate education, scholarly activity and prior mentoring experience with respect to their research self-efficacy, the perceptions of research training environment and interest in research, three separate ANOVAs will be implemented. If a difference is noted, the study employed least significant difference (LSD) for the different variables.

For research question number four, Structural Equation Modeling (SEM) results were examined. SEM allows a research to examine results from previously tested regression procedures to correct variable estimated relationships for measurement error (Raynov & Marcoulides, 2006).

IRB Considerations

An application was submitted to the Institutional Review Board (IRB) for approval for the study at the University of Central Florida. The IRB approved the study. The data being used for the study was anonymous. All survey information was anonymous. There were no requirements of the participants to complete the survey packets. Participation to complete the surveys was strictly voluntary. The study had minimal risk to the participants which the researcher expected quick approval.

Potential Limitations of the Study

1. Not obtaining sufficient enough sample size.

2. The study is not experimental in design and causality may not be inferred. Sample is not random (quasi-experimental).

3. The population is specific to Counselor Education doctoral students

4. Research experiences in CACREP programs only.

5. The study only looks at students at certain points in their respective academic careers. The same students might be similar or even different examined during different years (i.e. longitudinal)

6. Study is predominately self-report.

7. The study is only looking at the mentoring experiences of Counselor education doctoral students with respect to research self-efficacy and not other areas such as teaching self-efficacy and supervision self-efficacy.

8. One chosen instrument (RMES) Hollingsworth and Fassinger, (2002), is not as well researched as the other two instruments even though the instrument is based on other instruments.

9. Survey packets were collected from both standard mail method and electronic survey method.

The researcher made every attempt to follow the survey method design as prescribed by Dillman Smyth, and Christian (2009). In spite of efforts to maintain the survey methodology as prescribed by Dillman et al., limitations were present. There might be potential bias between respondents and non-respondents. Completed survey instruments packets by participants could be due to whether or not the participants find value in the research itself. A potential bias might exist between participants who responded via standard mail method versus electronic method. Participants choosing to complete the survey instruments via electronic method might do so for the sole purpose of convenience. Response rates for electronic methods might be slightly higher since the participant is able to complete the survey at any time and does not have to be bothered by having to be responsible for paperwork. Lower response rates can have the potential of making inferences to the whole population difficult (Ary et al., 2010).

The chosen sample of participants is pertinent to doctoral students in Counselor Education and not to other disciplines. While the discipline of Counselor Education is a related discipline to counseling psychology (Aletruse, 1991), there might be inherent differences between the

disciplines that could account for discrepancies should a sample be chosen from a cross-discipline sample. The current study does not utilize true experimental design (e.g., use of random sampling), which is the most efficient way of showing a cause and effect between two variables (Gall et al., 2007).

Low response rates are common to survey methods (Ary ert al., 2010). According to Dillman et al. (2009), efforts should be included to maximize participation and reduce low response rates, including but are not limited to: (a) follow-up cards or letters; (b) reminders; and (C) incentives (usually monetary in the form of dollar bill in standard mail or random drawing on electronic). Therefore, the three identified methods to support a sound response rate were followed for the study.

Summary

This chapter contains the introduction, purpose of study, research questions and hypotheses, and the assumptions and the limits inherent in this study. Research has shown that many doctoral students are unclear of the expectations of their respective programs (e.g. Belar, 2000). It is also important that research training involves the competent research training of students and selecting those students who can balance the roles of both practitioner and researcher(Gelso, 1993; Gelso &Lent, 2000; Lambie & Vacarro, 2011; Parker & Detterman, 1988; Pillay & Kritzinger, 2007). Programs need to be designed in such a way that allows for students to receive necessary mentoring in their research which will facilitate greater research competency and overall interest in research. The ultimate goal of the programs is to increase the knowledge in the field. Counseling programs that follow the CACREP 2009 standards must make every effort to ensure that research is being conducted as part of the curriculum and is also

being done in such a manner where the students are effectively trained (CACREP, 2009; Gelso, 1993; Love et al., 2007; Vaccaro, 2009).

Potential Contribution of the Study

The intent of this study is to contribute to the knowledge of the three constructs in the field of Counselor Education. The goal of the research is to identify where the limitations are in order to improve the training environments of doctoral students in Counselor Education. By identifying where the limitations are with regards to the three constructs, the hope is that these three areas can be better served.

CHAPTER TWO: REVIEW OF THE LITERATURE

Chapter two reviews the literature that examines the constructs of research self-efficacy, interest in research, and research mentoring. The chapter begins with a review of the significant role of research in counseling and counselor education. Next, the chapter introduces the constructs of research self-efficacy, interest in research, and research mentoring and the empirical investigation examining these three constructs. The chapter concludes with a summary of the reviewed literature and research.

The Importance of Research

Research is an expectation for graduate students and their respective faculty regardless of the discipline. Research in educational fields should be emphasized as much has other disciplines since there are just as many advanced degrees awarded, if not more than in other disciplines such as engineering or the life sciences (Shulman, Golde & Bueschel, 2006). Research is a programmatic expectation for doctoral students in counselor education and necessary to advancing the profession (CACREP, 2009; Lambie et al. 2008; Love, Bahner, Jones & Nilsson, 2007; Ramsey, Cavallaro, Kiselica, & Zila, 2002). Research is broad and entails a large number of scholarly-based activities (e.g., publications, presentations, scientific inquiries, etc.) which serve to further develop a respective field (Boyer, 1990; Gelso et al., 1988; Miller, 2006). Therefore, the development of research competencies in educational and counseling professions is essential for these professions to advance.

One of the foremost considerations in research is the process of writing, which may result in the dissemination of research findings in the form of article publications in refereed journals. McGrail, Rickard, and Jones (2006) stated that "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" (p. 19). For this purposes of this investigation, *research* is defined as those activities that include but are not limited to the following: (a) inquiries of a scientific nature that include both quantitative and qualitative methodologies (Cohen, Manion, & Morrison, 2007); (b) the production and application scholarly findings (Boyer, 1990); (c) distribution of research findings (Lambie et al., 2008); (d) collaboration of research findings within the confines of academia and clinical practice (Heppner & Anderson, 1985); and (e) the training of future researchers (Gelso, 1993; McGrail, Rickard & Jones, 2006). Research as noted is not limited to scholarly writing. Research includes disciplines on teaching strategies, grant proposals, and presentations at national and international conferences. In addition, research include activities such as creating an online resource (e.g., Boyer, 1990; Erwin, 2001; Miller, 2006; Lambie et al., 2008; McGrail et al., 2006; Shulman et al., 2006; West, Bubenzer, Brooks Jr., & Hackney, 1995).

The Boulder Model (now called the Scientist-practitioner model) was developed as the archetypal method for PhD programs for combining research and practice into a singular discipline. The model was the culmination of the Boulder Conference on Graduate Education in Clinical Psychology, which was held in Boulder, Colorado in 1949. The Boulder Model is considered to be the principal means of training for graduate training in social sciences at the doctoral level (Aspenson & Gersh, 1993; Baker & Benjamin, Jr., 2000; Benjamin & Baker, Jr.,

2000; Raimy, 1950). Research-based training is a primary component of the model (Chwalisz, 2003). Research is important for the development of any discipline. Specifically, the discipline of Counselor Education is dependent on research to advance professional practice and support the discipline's theoretical constructs (Belar, 2000; Galassi, 1989; Lambie et al., 2008).

The primary principle guiding the Boulder Model is that within doctoral preparation programs, there needs to be a balance between research and practice. The Scientist-practitioner model does not require that individuals spend equal time in both disciplines, nor does it dictate spending inordinate time in one discipline (e.g., spending more time in research or vice versa). The relationship between the two disciplines is more in lines with a mutually beneficial relationship where research promotes good practice and practice promotes further research. Exposing doctoral students in social sciences to both disciplines helps facilitate the healthy balance between the two (Chwalisz, 2003; Horn et al., 2007; Shapiro 2002; Stoltenberg et al., 2000). Essentially, one of the functions of research training is to prepare other researchers in the development of research skills.

Research is not only intended for developing the field and increasing the knowledge base of the field, but it also serves to create accountability. In the field of counseling, evidenced-based practice and accountability are significant (Belar, 2000; Granello & Granello, 1998; Kahn, 2001; Plante, Couchman, & Diaz, 1995; Sexton & Whiston, 1996; Stoltenberg et al., 2000). For developing scientist-practitioners, Stoltenberg et al. (2000) recommend that research be an integral part of the curriculum for doctoral students where they are not only taught research methodology but also how the research is involved with practice. Gelso (1993) noted that the training of scientist-practitioners should include selecting those individuals who are well suited

for that role. Practicing counselors should be skilled in research in order to provide the effective practice for their respective clients since they are the main patrons of research in the field (Bowman, 1997; Falvey, 1991; Gelso, 1993).

Gelso (1979) theorized that the improvement of the counseling profession increases with good research. Gelso et al. (1988) recommend that one of the best ways to improve the quality of research in the training environment is by "providing opportunity for students to interact with established scholars" (p. 404). Gelso and colleagues further recommend that encouragement of students in training to do research their own research facilitates their development as researchers.

Research is a focus for counselor educators. The identity of being a researcher is both an issue for counselor educators and their respective students. In their clarification of their professional identity, counselor educators and their students might ask themselves if they are researchers, counselors, or a combination of the two. The identity of counselor educators can be based on the following: (a) respective membership affiliation (e.g. membership with American Counselor Association, Association of Counselor Education and Supervision; Calley & Hawley, 2008); (b) the actual practice of counselor educators (i.e., researcher/teachers or clinicians; Lanman, 2011); (c) the type of research being conducted (i.e., quantitative vs. qualitative; Reisetter et al., 2004); and (d) whether or not they are interested in conducting research (e.g., Geisler, 1995). Essentially, identifying oneself as a researcher contributes to future research behaviors; however, this assumption should not be made for all students (King & Otis, 2004).

There is a gap that exists between research and practice (King & Otis, 2004; Owenz & Hall, 2011). Many practitioners have resentment and place no value of doing research within the profession (Robinson III, 1994). Research should be encouraged by practitioners since it helps

promote good practice within the profession (e.g., Bowers, Minichiello, & Plummer, 2007). The Scientist-practitioner model has limitations; however, the general guidelines of the model support a profession in distinguishing itself from other disciplines. The scientist-practitioner model encourages practitioners to conduct research that improves and further develops the behavioral science fields, which includes counseling (Heppner, & Anderson, 1985; Robinson III, 1994; Stoltenberg et al., 2000).

Boyer (1990) noted that research includes the components of discovery, integration, and implementation, with each component equally as important as the other. Ramsey, Cavallaro, Kiselica, and Zila (2002) investigated counselor educators' ($N = 113$) professional activities over a three-year period. Specifically, the researchers examined that counselor educators reported behaviors of (a) journal articles, (b) conference presentations, (c) other published works, (d) other written works, (e) professional leadership roles, (f) scholarly works pertaining to teaching, and (g) other professional activities. The results identified diversity of scholarly activity among counselor educators, with conference presentations having more activity than the other professional areas. The researchers concluded that "counselor educators use a more inclusive definition of scholarship than do the institutions that evaluate them in tenure/promotion decisions" (pp. 50-51). Counselor education programs do not lack in what constitutes promotion for their faculty. A primary concern for the profession of counselor education is that new faculty members do not identify themselves as counselor educators, which is important for the field of counselor education to continue to develop and advance (Maples & Altekruse, 1993).

While research experience is important for counselor educators seeking promotion, the attainment of that process can only occur when there is some mentoring inside the practice to help guide it along. The research mentorship process should occur during graduate training and the initial stages of new faculty experience (Borders et al., 2011; Gattis, 2008).

The principle of "publish or perish" is an ever-constant theme that permeates the atmosphere of most academic environments. In spite of this concept, the research skills and experience in various areas is necessary not only for new faculty to be competitive and earn tenure and promotion; it is also essential for the development of any academic discipline (De Rond & Miller, 2005; Ramsey et al., 2002; Wilson, 2001).

Counselor educators' ethical practices related to their research behaviors. Specifically, the ACA (2005) *Code of Ethics* note the importance of disseminating the research findings amongst other professionals and making the research available (i.e., publication of findings; Standard G). Research is not only important for professors and students in training; it is also important for practitioners in the field. For example, the American School Counselor Association (ASCA, 2010) *Ethical Standards for School Counselors* identifies research as an expectation for counselors in the profession and an ethical consideration. The ethics dictate both that research should be conducted in a professional manner and that the findings shared within the practice of school counseling and related professions.

Research practices are significant in a profession's ability to substantiate its necessity (e.g., Horn, Troyer, & Hall, 2007; Okech et al., 2006). In addition, pedagogical strategies in universities need to be structured in such a way where the students are prepared to be competitive in the job market (Golde, 2007). Some o pedagogical methods used to train students

to be future faculty are not effective and necessitate modification (Golde, 2008). The next section of the chapter reviews research examining scholarly productivity in counselor education.

Research Productivity in Counselor Education

Research productivity is a requirement for most tenure-track faculty members; however, many graduates from counselor education doctoral programs do not feel prepared to be effective in conducting and publishing sound research (e.g., West, Bubenzer, Brooks Jr., & Hackney, 1995). While research is encouraged for students, there are limited examples in the counselor education literature that examined research activities in this field (e.g., Briggs, 2006; Briggs & Pehrsson, 2008; Reisetter et al., 2004). Miller (2006) studied the relationship between the scholarly activity of counselor education doctoral students ($N = 102$) and intrinsic versus extrinsic goal aspirations. The study used the Doctoral Student Scholarly Activity Survey (DSSAS; created by the author in a pilot study with a reported internal consistency of .89 for the pilot study and a .84 for the study), the Aspirations Index - Revised (Kasser & Ryan, 1996), and the Perceived Autonomy Support: The Learning Climate Questionnaire (LCQ; Williams & Deci, 1996). The DSSAS was based on Boyer's (1990) four proposed forms of scholarship and the Scholarly Activity of Counselor Educators (Ramsey, Cavallaro, Kiselica, & Zila, 2002). Miller reported an alpha coefficient for the Aspirations Index to be .76 for both subscales of the instrument. The LCQ coefficient alpha was reported to be .95. The results identified that as frequency of scholarly activity increased, the amount of time the students spend in their respective programs decreased. Miller also found that when social context increased, so did the scholarly activity. Miller did note a limitation to the study was the use of the first instrument, which, while based on other instruments, was only studied in one prior study (her pilot study).

Nevertheless, the findings supported importance of counselor education doctoral students' scholarly activities in their development as researchers.

Students who graduate from counselor education doctoral programs may not be well prepared for tenure and promotion (e.g., Eisenhart & DeHaan, 2005; Golde, 2008; Gelso, 2006; Ramsey et al., 2002; Sprenkle, 2010). The literature on research training is limited in counselor education. While the emphasis for the doctoral degree is research-based, students are not acquiring the research skills upon completion of the degree (Lambie & Vaccaro, 2011; Ramsey et al., 2002; Warnke, Bethany, & Hedstrom, 1999). Since the research training of doctoral students is limited (e.g., Eisenhart & DeHaan, 2005), it becomes imperative that studies be conducted that investigate the concepts of research training among doctoral students along with the first few years of new faculty members' experience (Borders et al., 2011; Lambie & Vaccaro, 2011; Magnuson, Norem, & Haberstroh, 2001; Magnuson, Shaw, Tubin, & Norem, 2004).

Maples and Altekruse (1993) stated that the discipline of counselor education was on a decline because of the opinion that it did not warrant the same consideration as similar disciplines such as psychology and counseling psychology. While the profession of counselor education stresses the importance of research development (CACREP, 2009 Section II, G.8.a.), more should be done by programs in order to ensure that it is being carried out effectively (Lambie & Vaccaro, 2011).

Gordon, McClure, Petrowski, and Willroth (1994) investigated the research productivity of 78 CACREP accredited programs that offered masters or doctoral degrees in either counseling psychology, counselor education, or related fields. The study included examining the publication history of CACREP schools between the years 1974-1992. A total of 6,322 journals were

examined from PSYCHLIT. Of the journals examined, 13 were ACA journals. They found that the faculty that were in the CACREP schools accounted for a total of 866 (13.7%) of the total number of articles published. The majority of the articles published by CACREP institutions came from doctoral granting institutions. Gordon and colleagues recommended that students with a strong research background consider graduate training in a program where research is highly emphasized.

Rawls (2008) examined the occupational commitment of doctoral students in counselor education. The occupational commitment was defined by Rawls as the intention for the students to pursue careers as future counselor educators which requiring research activity as part of the profession. The study involved a convenience sample ($N = 577$) of student members of ACES. The study involved administering three instruments: the short version of the *Self-Efficacy in Research Measure* (SERM; Phillips & Russell, 1994; created by Kahn & Scott 1997), the *Research Mentoring Experience Scale* (RMES; Hollingsworth, & Fassinger, 2002), and the *Occupational Commitment Scale* (OCS; Meyer, Allen, & Smith, 1993). The internal consistency for the SERM was .96 for the full version and .90 for the short version. Hollingsworth and Fassinger (2002) reported the internal consistency for the RMES was .74. The OCS had six domains with an internal consistency ranging from .82 to .74. Results identified that positive research mentoring experiences were better indicators of occupational commitment than research self-efficacy. Rawls also reported that there was a gender difference with males reporting lower research mentoring experiences than females.

Ramsey and colleagues (2002) examined the scholarly activity of counselor educators (*N* = 113) from 47 out of 104 CACREP-accredited programs across the country over a three-year period between 1992-1995. The participants consisted of 88.5% faculty with doctoral degrees, and the remaining 11.5% had master's degrees. The majority of the participants were tenured (59%), with the remainder being non-tenured but tenure seeking (32%), and non-tenure track (9%). The authors created a survey called the *Scholarly Activity Survey* for the purpose of the study. The results identified that during this three-year period, counselor educators spent the most time in scholarly activity that was related to other professional duties. Examples of other duties were workshops, in-service presentations, and consultations. Conference presentations were listed as the next most practiced activity. The remaining scholarly activities listed were journal publications, other written works, other published works, and scholarly works related to teaching. The findings indicated that counselor educators are involved in a more diverse practice of scholarly activity than what is generally expected for tenure and promotion. These findings helped expand the definition of what was considered scholarly activity for counselor educators. Previous studies (e.g., Baruth & Miller, 1977) only listed scholarly activity as presentations, publications, and leadership, while Ramsey et al. included scholarly activity related to teaching and activities related to the profession itself. Ramsey and colleagues (2002) investigated CACREP programs which would pose a limitation in generalizing the definition and results to related disciplines or other disciplines. The study also used self-report as a measure rather than actual publications and presentations of the participants.

Okech et al. (2006) investigated 167 counselor educators from CACREP programs and related educational programs regarding the research training they received during their doctoral studies. The authors used systematic sampling and selected the fifth item of the population, and the starting point was selected randomly. The sample selected consisted of educators who were tenured, tenure-seeking, or non-tenured (i.e., instructors, adjuncts, or visiting instructors). A web-based survey was created for the study. The survey used consisted of (a) a demographic sheet, (b) information on the participants research activity, (c) specifics about their degree-granting university (which included the actual coursework and mentoring), and (d) a free response section. The demographic sheet asked about the accreditation of their degree-awarding university. The majority graduated from CACREP programs (48.6%), and one individual graduated from a program accredited from both CACREP and the American Psychological Association (APA). There were 10 participants who graduated from programs with no accreditation. The section of the survey that included the research training contained 30 questions and used a 5-point Likert scale. The responses on the questionnaire included "5 =*strongly agree,* 4 = *agree,* 3 = *uncertain/neutral,* 2 = *disagree,* and 1 = *strongly disagree*" (p.135). The questionnaire was subdivided to assess participants' perceptions of their training in quantitative research, training in qualitative research, and the mentoring of their respective research. The internal consistency of the mentoring was reported to be .69, and for the preparedness of qualitative research to be .90. The internal consistency for the items related to preparedness for training in quantitative training was .84. Results indicated that research training is not the same at every CACREP program and related educational programs that grant doctoral degrees. There are different perceptions of the research preparedness and mentoring that exist at

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these respective educational programs. The finding also indicated that depending on what decade training occurred, counselor educators who graduated during the 1970s and 1980s reported more training in quantitative methods, while counselor educators who graduated in decades after the 1970-1980s had training in both quantitative and qualitative methods. A limitation of the study was that the participants only represented 44% of the total CACREP programs available. The authors also noted a limitation of the study was the actual participants might have been vastly different on scholarly activity to non-participants (i.e., could be more or less productive). Nevertheless, the findings contribute to a broader definition of scholarly activity than prior definitions (e.g., Baruth & Miller, 1977).

Royalty and Magoon (1985) examined 296 faculty members at American Psychological Association (APA) counseling psychology doctoral training programs. The participants were 75% male (n = 222). Participants had a range of publications from 0 to 49. The study involved the administration of the *Vocational Preference Inventory* (VPI) (Holland, 1978) and the *Scholarly Productivity Survey* (SPS) which was created by the authors for the study. The VPI test-retest reliability scores range from the .70s to the .90s over a two-month period. This instrument consisted of a demographic questionnaire, Likert item questionnaire, and like-dislike items. The authors used three independent judges to evaluate the first 125 items on the questionnaire (excluding the demographic items). The independent judges agreed completely on 90 of the 108 items with two-thirds agreement on the remaining items. The additional 38 questionnaire items were dichotomous items based on Thorndike's *Activity Preference Scale* (1955). The authors noted that the items had Kuder-Richardson reliability coefficients from .78 to .90. The results identified that individuals who obtained a doctorate at a younger age and

showed an interest in research while in graduate school were higher producers of scholarly research. The results also indicated that the higher-producing participants tended to associate themselves with individuals who had similar professional interests and scholarly activity, while the lower producers of scholarly activity reported being more interested in the practical application of the scholarly works.

Royalty and Reising (1986) randomly selected 500 participants from Division 17 of APA. There were a total of 355 usable surveys. The participants were 82.8% ($n = 294$) male and 17.2% ($n = 61$) were female. Also, 32% of the participants graduated from APA programs. The authors administered a demographic information sheet, an open-ended response section, and the *Survey on Research Training* (SORT). The SORT was developed by the authors for the purpose of the study. The SORT is a 5-point Likert item scale. The authors did not report on internal consistency of the instrument. The SORT consisted of 23 items that were related to participants graduate program contribution to research skills, 19 items that were related research-related activities and 23 items related to current research skills. Results indicated that participants found that their graduate programs contributed to their research skills, design, statistics knowledge, and usage and writing. The participants reported that their programs did not contribute very well to their computer skills and practical research skills. Practical research skills were defined by the authors as "forming and managing a research team, resourcefulness, time management, and clerical skills" (p. 52). Additional results also indicated that programs and training activities had a positive impact on research interest. Limitations were that not all of the participants gave responses to the open-ended questions and that while the faculty members were employed in APA programs, only 32% of the respondents had actually graduated from APA programs.

Miller (2006) investigated the scholarly activity of counselor education doctoral students enrolled in CACREP and non-CACREP accredited programs. Participants were randomly selected from doctoral student members of the ACA and ACES. An inclusion of convenience sampling was also utilized by the author. The study consisted of 103 participants. They were surveyed on their perceived importance of scholarly activity. The study included three instruments: (a) the *Doctoral Student Scholarly Activity Survey* (created by author for purpose of the study), (b) the *Aspirations Index* (AI; Kasser & Ryan, 1996), and (c) the *Perceived Autonomy Support: The Learning Climate Questionnaire* (LCQ; Williams & Deci, 1996). Results indicated that as the frequency of scholarly activity increased, the length of time spent in a doctoral program decreased. Intrinsic and extrinsic goal aspirations were good predictors of scholarly activity. Social context (scores on the LCQ) was the strongest indicator of scholarly activity in the study. As scores for social context increased, the importance of scholarly activity also increased. A limitation of the study was that the instrument designed by the author for the study was only previously researched in a pilot study with limited research on internal consistency of the instrument. A limitation noted by the author was that the participants from CACREP programs might be more engaged in conducting research than non-CACREP participants since research is expected for CACREP accreditation. Another limitation Miller noted was that the study did not look at students who were non-members of ACA or ACES. Miller suggested that non-ACA and non-ACES members might have some hesitancy of conducting research as compared to members of ACA and ACES.

Roy, Roberts, and Stewart (2006) examined research productivity with 1,737 current professors of clinical psychology who graduated from APA accredited schools. The authors used *PsycINFO* as a means of comparing the actual research productivity of the professors based on their names. The publications were reviewed for type of publication (i.e., was it peer reviewed, non-peer reviewed, book chapters, etc.) over a period from 2000 to 2004. Results indicated that the average graduate from an APA clinical psychology program had 9.59 publications over a five-year period, or less than two per year. There were 220 professors who had not produced a single publication over this period. The study also looked at the *U.S. News &World Report* rankings of each of the programs. The results found that there was a strong correlation with program ranking and number of publications. The authors did caution that the USNWR rankings tend to favor programs with a large number of faculty members.

Kahn (2001) administered surveys to 149 counseling psychology doctoral students that attended 12 randomly selected APA counseling psychology schools. The instruments used in the study were the *Vocational Preference Inventory, Form B* (VPI-B; Holland, 1985), the *Research Training Environment Scale-Revised Short Form* (RTES-R-S;Kahn & Miller, 2000), a modified form of Noe's (1988) *Mentoring Functions Scale* (MFS), the scholarly activity scale developed by Kahn and Scott (1997), and the Self-Efficacy in Research Measure (SERM; Phillips & Russell, 1994) with a 12-item version developed by the Kahn and Scott (1997). Each instrument had strong internal consistency reported by the author. The internal consistency for the RTES-R-S was reported to be .85 for the VPI-B, .62 for the Scholarly Activity Scale .70, and for the SERM to be .89. The study also included length of time in doctoral training. Results indicated that scholarly productivity was predicted by research self-efficacy, research interest, and

student's year in the program. Additional results identified that students' perceptions of

mentoring relationships did not factor into the prediction of scholarly activity. Next, a review of

the research related to construct of research self-efficacy is provided.

Research Self-Efficacy

Research self-efficacy is based on Bandura's (1977) theory on self-efficacy. According to

Bandura, self-efficacy is the belief of an individual to perform tasks or behaviors that result in

goals. Considering the application of self-efficacy in research, this can be applied to such tasks

as "conducting research and developing scholarly works" (Lambie & Vacarro, 2011, p. 244) and

having the "confidence in being able to successfully complete various aspects of the research

process" (Kahn & Scott 1997, p.41). There have been several studies that have looked at the

importance of research self-efficacy as being a predictor of scholarly activity for graduate

students (e.g., Bieschke, Bishop, & Garcia, 1996; Phillips & Russell, 1994).

Pasupathy (2010) investigated a convenience sample of 109 faculty members' levels of

research self-efficacy. Instruments used in the study were the *Research Self-efficacy Inventory*

(RSEI, Siwatu & Pasupathy, 2010) and the *Research Productivity Index*, which the author

reported was created for the study and adapted from Thoreson, et al. (1990) scale on research

productivity. The author did not report on the internal consistency of the Research Productivity

Index. The RSEI contained four subsections, which included (a) General Research Self-Efficacy

Scale (GRSE; .94 reported internal consistency); (b) a Quantitative Research Self-Efficacy Scale

(QNRSE; .97 reported internal consistency); (c) a Qualitative Research Self-Efficacy Scale

(QLRSE; .96 reported internal consistency); and (d) Mixed Methods Research Self-Efficacy

(MMRSE; internal consistency not reported). Results for the quantitative part of the study

identified a small correlation between research self-efficacy and research productivity. The qualitative results indicated that the higher education environment plays an important role in the development of research self-efficacy development and research productivity.

Specifically, the training the faculty received during their years as graduate students greatly influenced their personal self-efficacy beliefs (Pasupathy, 2010). A limitation of the study was the instruments themselves. While the reported internal consistency for the RSEI was high for three of the four subsections (ranged from .94 to .97), one subsection (the MMRSE) did not report internal consistency. The RSEI was not well represented in the literature. The internal consistency for the *Research Productivity Index* was not reported, so it is unknown whether or not this instrument would be valuable for studying this construct. The study does stress the importance of developing a mentoring relationship as part of graduate training in order to influence research-self efficacy and research productivity.

Vaccaro (2009) conducted a national study of 89 doctoral students in counselor education examining the relationship between research self-efficacy, interest in research, and the research training environment. The study was cross-sectional in that it examined the relationship of the three variables comparing first-year doctoral counselor education students to third-year and beyond counselor education doctoral students. The study included the use of the *Research Self-efficacy Scale* (RSES; Greeley et al., 1989), *Interest in Research Questionnaire* (IRQ; Bishop & Bieschke, 1994), and the *Research Training Environment Scale – Revised* (RTES-R, Gelso et al., 1996). Vaccaro reported a Cronbach's alpha of .96 for the RSES, .93 for the IRQ, and .78 for the RTES in her study. There were 59 females, 29 males, and one listed as other in the sample. Further, 68.5% of the participants reported that they were in their second year of study. It was

reported that 69.7 % (*n* = 62) did not have any scholarly publications. The results identified that scholarly activity had an effect on research self-efficacy scores. Interest in research was positively correlated with research self-efficacy scores but did not have a statistically significant relationship with the research training environment. A limitation of the study was the small sample size utilized. Nevertheless, the findings supported the significant of research self-efficacy in the development of counselor education doctoral students' research competencies and behaviors.

Gelso, Mallinckrodt, and Judge (1996) investigated 173 students who were enrolled in six different doctoral programs. Four of the programs were in counseling psychology while the other two were in clinical and school psychology. The programs were located at four different universities. The participants comprised individuals from first year to fifth year and beyond. The study involved the use of the *Research Training Environment Scale-Revised* (RTES-R; created by the authors from the original RTES for the study), the *Scientist-Practitioner Inventory* (SPI; Leong & Zachar, 1991), the *Self-Efficacy in Research Measure* (SERM; Phillips & Russell, 1994), the *Attitudes Toward Research Measure* (Royalty et al., 1986), and the *Rosenberg Self-Esteem Scale* (Rosenberg, 1965). The authors reported internal consistency for the RTES-R to be .90. Results identified that the RTES-R correlated positively with research self-efficacy and attitudes in research during graduate training.

Other instruments besides the RSES have been used to examine research self-efficacy of graduate students (e.g., Pasupathy, 2010). Phillips and Russell (1994) examined 125 doctoral graduate students in counseling psychology with the RTES and the SERM, which was developed by the authors. The Cronbach's alpha for the RTES was .92. The authors conducted a test-retest

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reliability for the RTES, and the coefficient yielded was $r = .83$, which was for a two-to-four week interval. The internal consistency for the SERM was reported to be .96. Results identified a positive relationship between research self-efficacy and the research training environment, and there was a positive correlation between research self-efficacy and research productivity. The authors reported that there was no significant relationship observed between research productivity and the research training environment when the variables were observed across all the participants.

In a study conducted by Holden, Barker, Meenaghan, and Rosenberg (1999), participants were selected from a social work program with 45 master's students in their final research methods class; there were also 24 master's students and 22 bachelor's students in their first research class. No demographic information was obtained during the study by the authors. The authors developed the *Research Self-efficacy* (RSE) scale as part of the pilot study. The RSE is a 9-item, 11-point scale with responses ranging from 0 (cannot do at all) to 100 (certain can do). The internal consistency for the RSE was reported to be .94. The study used a pre-test/post-test format. Results identified that participants showed positive changes on the RSE after completing a research methods class. Limitations were that the sample was from a convenience sample and was therefore non-random. The sample size was also relatively small ($n = 91$).

Bieschke, Bishop, and Garcia (1996) administered the *Research Self-Efficacy Scale* (RSES; Greeley et al., 1989) to 177 doctoral students across varied disciplines enrolled in a large eastern university. The disciplines included biological, social sciences, humanities, and physical sciences. The purpose of this study was to examine the usefulness of the RSES as an instrument to measure research self-efficacy. The participants had been enrolled in doctoral programs at

least three years. The authors noted that 36% of the sample had not taken a statistics course and 42% did not have a class in research design. Results identified that the number of years in graduate school and involvement in research activities contribute significantly to predicting research self-efficacy for doctoral students. The internal consistency of the instrument was .96.

Forrester, Kahn, and Hesson-McInnis (2004) examined three measures of research self-efficacy: (a) RSES (Greeley et al., 1989), (b) SERM (Phillips & Russell, 1994), and (c) the *Research Attitudes Measure* (RAM; O'Brien, Malone, Schmidt, & Lucas, 1998). The authors reported internal consistency results to be .98 for the RSES, .96 for the SERM, and .89 for the RAM. The participants were chosen from the APA of Graduate Students (APAGS) from the following disciplines: (a) industrial-organizational, (b) school counseling, and (c) clinical psychology. The instruments were administered via a website link. The study involved a total of 1,004 participants. The purpose of the study was to confirm the factors structures of the three measures and to also determine in what areas the three instruments overlap.

Mullikin, Bakken, and Betz (2007) conducted a study with 210 participants in the medical field concerning biomedical research. Participants consisted of students, post-doctoral physician trainees, and MD/PhD faculty. The purpose of the study was to examine the career interests and research self-efficacy of individuals in the medical field. The Clinical Research Appraisal Inventory (CRAI) was developed by the authors for the purpose of the study. The authors reported the internal consistency for the CRAI to be .96. The results indicated that research self-efficacy is a good indicator for career development in the medical field. Additional findings did not find a significant relationship between prior research experience and interest in research. One limitation noted in the study was the small sample size for test-retest reliability

scores. The sample was meant to be diverse, but it consisted primarily of white, non-Hispanic participants. The sample consisted of faculty members (93%) with the remaining participants (7%) including students and residents.

Unrau and Beck (2004) compared gains in research self-efficacy over a semester with 60 Social Work (SW) and 75 Speech-Language Pathology (SLP) students using the RSE (Holden et al., 1999), which is a nine-item inventory of research related tasks. The internal consistency of the RSE was.94. The instrument was administered at the beginning of the semester and again at the end. The purpose of the study was to compare the research self-efficacy in individuals that were enrolled in practice coursework versus individuals that were enrolled in both practice and research coursework. Results identified that there were greater gains for the SLP students than there were for the SW students. Limitations noted were threats to internal validity. Of the threats noted were maturation of the participants, history, and differential selection. One of the recommendations made by Unrau and Beck was to include research coursework as part of the academic curriculum in order to facilitate greater confidence in conducting research.

Regarding the completion of dissertations, Geisler (1995) conducted a study with 24 randomly selected APA-accredited counseling psychology programs, which constituted a total of 255 participants. The participants in the study had entered doctoral training between the years 1987 and 1991. The purpose of the study was to examine scientist interest, practitioner interest with regards to research self-efficacy, perceptions of the research training environment, and their relation to dissertation progress. Results identified that research self-efficacy was positively related to dissertation progress and perceptions of the research training environment were not significantly related to dissertation progress. Scientist interest was positively interrelated to

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research self-efficacy. Geisler reported that the most influential factor in dissertation completion was research self-efficacy.

In the review of the literature, different measures of research self-efficacy (e.g., RSES; Greeley et al., 1989; SERM; Phillips & Russell, 1994; RSE; Holden et al., 1999; SERM; Phillips & Russell, 1994; RSEI; Siwatu & Pasupathy, 2010) were identifed. The instruments were used in conjunction with other instruments to see what factors influence research self-efficacy (e.g., Vacarro, 2009) and how valid three different instruments are for usage in studying this construct (Forrester, Kahn, & Hesson-McInnis, 2004). The literature reviewed about research self-efficacy supported the rationale of studying research self-efficacy and how it relates to the other constructs that will be discussed in the next two sections. The next section of the chapter introduces the construct of interest in research and reviews the pertinent research.

Interest in Research

Doctoral students with higher research self-efficacy have greater interests in conducting and participating in research (e.g., Lambie & Vaccaro, 2011). In Social Cognitive Career Theory (SCCT; Lent, Brown, & Hackett, 1994), relevance of career choice relate with an individual's self-efficacy and interest. One of the essential components of SCCT is that motivation to engage in behaviors is based on our self-efficacy and interest in that activity. Without the factors of self-efficacy and interest, the decision-making process to engage in activities such as research would not occur.

Appreciating SCCT is a good place to start in order to understand interest in research (Bard, Bieschke, Herbert, & Eberz, 2000). Interest in research may be promoted if an environment facilitates activities related to research (Royalty et al., 1986). Having faculty that

create positive environments for students can lead to greater interest of students in conducting research since the behavior is positively modeled for them (Shivy et al., 2003). Research interest, along with low research productivity, is an area of concern for educators of graduate students (Betz, 1997).

Bishop and Bieschke (1998) completed a study with 184 counseling psychology doctoral students throughout the United States. The study included the administration of the *Vocational Preference Inventory—Form B* (VPI-B; Gottfredson, Holland, & Holland, 1978), which had been modified for research purposes from the original *Vocational Preference Inventory* (VPI; Holland, 1985). It included the RTES (Gelso, Mallinckrodt, & Royalty, 1991), RSES (Greeley, et al., 1989), the *Research Outcome Expectations Questionnaire* (ROEQ; Bieschke & Bishop, 1994), and the IRQ (Bishop & Bieschke, 1994). The VPI-B used a test-retest format in the administration of the instrument. The internal consistency was reported to be .62 to .77 (test-retest) for the VPI-B, .97 for the RSES, .92 for the RTES, .91 for the IRQ, and .89 for the ROEQ. A path analysis was used in the statistical analysis. The primary purpose of the study was to examine what variables influence interest in research. Results identified that research outcome expectations, research self-efficacy beliefs, investigative interests, artistic interests, and age were significant predictors of research interests.

Webb (2004) investigated vocational interest as to why students choose to enroll in Ph.D, Psy.D, or Master's level training programs in counseling and/or psychology. The study included 73 participants in the entering class of three psychology and counseling training programs. The three programs were a PhD program in Clinical Psychology, a PsyD. program, and a Master of Arts program in counseling. The master's and Ph.D. data was collected at the beginning of their

degree program while the Psy.D data was collected after three months from when the

participants started. The vocational interests of the participants were measured using the Self-

Directed Search (SDS, Holland, 1994). The SDS is a 228-item self-administered instrument that

is separated into four sections. The sections of the instrument consist of occupations, activities,

competencies, and self-estimate. The SDS contains six personality types: (a) realistic (R); (b)

investigative (I); (c) artistic (A); (d) social (S); (e) enterprising (E); and (f) conventional (C).

Webb developed a questionnaire for the study entitled the *Program Preference A*ssessment

(PPA). The purpose of the study was to examine the relationship between vocational interest and

program choice and also to examine the relationship between vocational interest and the

engagement of research activities upon graduation. The results of the study found that students

do not choose degree programs based on vocational personality. Doctoral students appear to be

more aware of their program's training model as compared to master's students. A limitation of

study was the small sample size (N =73) of which the majority ($n = 43$) were master's students.

Bard and colleagues (2000) reexamined data from two previous studies on research interest

(Bieschke et al., 1995; Bieschke et al., 1998) to compare the factors that account for research

interest for graduate students and faculty in rehabilitation counseling. The studies consisted of 93

rehabilitation doctoral students (Bieschke et al., 1995) and 130 faculty members of master's and

doctoral programs (Bieschke et al., 1998). The instruments used for both of the studies were the

RSES (Greeley et al., 1989), the IRQ (Bishop & Bieschke, 1994), the RTES Gelso et al., 1986),

and the ROEQ (Bieschke & Bishop, 1994). The RTES was used in the Bieschke et al. (1995)

study and not in the Beischke et al., (1998) study. The first study examined doctoral students

whereas the other study examined faculty. Results identified that research outcome expectations

play an important role in predicting research interest for both doctoral students and faculty in rehabilitation counseling. A limitation was that the sample comparison of the two groups was different. An implication was that the research training environment for students has a significant impact in facilitating an interest in conducting research-related activities.

A qualitative study of research interest was conducted by Reisetter et al. (2004). The study was phenomenological in nature since the authors were interested in the specific experiences of the students in the study. The study involved interviewing six doctoral students in a counselor education program concerning their experience with an introductory qualitative research class. The methods employed in the study included a focus group, weekly reflective journals by the participants, and interviews. The reflective journals included having the participants record their experiences in qualitative research. Upon completion of the interviews, the researchers analyzed the content and came up with the following four themes: (a) worldview congruence, (b) theory and skills congruence, (c) research identity and professional viability, and (d) holistic nature of perceptions and experiences. The results identified that for five of the six participants, qualitative research was a positive experience. A limitation was that it only involved the experience of six students in an introductory class. An implications was that it looked at specific experiences of doctoral students in a research environment as opposed to the overall research environment.

James and Simons (2011) completed a study with 83 graduate students from an Addiction Studies and Community Counseling Program at a public, suburban Midwestern University. The instruments used in the study were the IRQ (Bishop & Bieschke, 1994), the Past Attitudes toward Research (PATR; Royalty, Geslo, Mallinckrodt, & Garrett, 1986), the short form of the

RSES (Kahn & Scott, 1997), the ROEQ (Bieschke & Bishop, 1994), and the RTES (Gelso et al., 1991). The results identified that the students in the addiction studies scored higher on research interest but lower on the research training environment than students in the community counseling program. Limitations were that there was a small sample size comparing the two groups and that the study was conducted in a mid-western University.

Mallinckrodt, Gelso, and Royalty (1990) surveyed 358 doctoral level counseling psychology students in 10 APA accredited programs on research interest, the training environment, vocational preferences based on Holland personality types, and the environment-personality interactions. The study included the use of RTES (Royalty et al., 1986), the Vocational Preference Inventory-Form B (VPI-B; Holland, 1978), and a 4-item 5-point Likert questionnaire created by the authors to assess research interest. The questionnaire included items that asked about students' attitudes toward required research projects, interest in doing research, and the value and priority of research activities upon graduation and career. The authors reported internal consistency for the 4-item questionnaire to be .85 on test and retest scores. The results identified that personality factors were stronger predictors of research interest than the other factors. A limitation was that the measure used for research interest was only a 4-item questionnaire that may not necessarily have been comprehensive enough to address research interest for graduate students. The questionnaire was reported by the authors to be based on how the participants believed they would respond to the items when they entered their doctoral studies as compared to their present status. The questionnaire was based on a student's memory of an event, which could be taken into account concerning the accuracy of the reported numbers.

West, Kahn, and Nauta (2007) completed a study of 132 graduate students at 11 universities. The participants ranged across different disciplines of psychology on dimensions of learning styles, research interest, and research self-efficacy. The participants were mostly doctoral students (73%), and the remaining participants were master's students. The instruments used in the study were the Index of Learning Styles (ILS; Felder & Soloman, 2000), the IRQ (Bishop & Bieschke, 1998) and the SERM (Phillips & Russell, 1994). The ILS consists of 44 statements with a two-option response for each question. The ILS consists of four subscales: (a) active-reflective, (b) sensing-intuitive, (c) visual-verbal, and (d) sequential-global. The internal consistency ranged from .65 to .81 for the ILS, was .90 for the IRQ, and was .93 for the SERM. Results identified that the students who were more verbal in their learning styles had greater research interests than students who were more visual in their learning styles. A limitation was the unequal group sizes of doctoral students and master's students. A contribution was that the construct of learning style was examined in its relationship to research interest.

Deemer, Martens, and Podchaski (2007) examined 114 doctoral students in counseling psychology were sampled from APA accredited programs in the United States and Canada. The study included the use of the IRQ (Bishop & Bieschke, 1994), the RSES (Greeley et al., 1989), Achievement Goal Questionnaire (AGQ; Elliot & McGregor, 2001), RTES-R (Gelso et al., 1996), and the ROEQ (Bieschke & Bishop, 1994). The AGQ is a 12-item measure with a 7-point Likert response. The item response of the AGQ range from 1 (*not at all true of me*) to 7 (*very true of me*). The AGQ yielded four factors in a factor analysis. The authors reported internal consistency for the AGQ four subscales to range from .78 to .89. The internal

consistency for the other instruments was .89 for the RTES, .89 for the ROEQ, .93 for the IRQ, and .97 for the RSES.

The participants were contacted via their respective program coordinators who disseminated the request for participants via program listservs to their students (Deemer et al., 2007). Results identified that mastery approach was a positive predictor for interest in research while performance avoidance goals were a negative predictor. Essentially, mastery of research skills promotes research interest. Study limitations included self-selection bias on the part of the participants in that only truly motivated participant might have elected to participate in the study. A contribution of the study was identifying research mastery as predictor for research interest in doctoral students. The next section will discuss research mentoring

Research Mentoring

While the research training environment is important for the development of new professionals in counseling (Gelson, 1979), an equally important function is the research mentoring that is a subset of that environment (Gelso & Lent, 2000). Research mentoring is pertinent to academia. The expression of research mentoring comes through the mentor-protégé relationship. Research mentoring is a relatively new construct in higher education and is starting to gain some attention. In spite of the gains in attention, there remains a lack of research examining the specific area of research mentoring and the differences that exist in perceptions of the mentors and protégés in the mentoring relationship (Briggs & Pehrsson, 2008; Clark & Wilson, 1998; Gattis, 2008; Strauss, 1995). According to Dohm and Cummings (2002), research mentoring facilitates growth for the mentee. If protégés are modeled positive research skills and encouragement, there is the likelihood that they will have a strong mentoring relationship with

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their future proteges. The following section discusses research on the construct of research mentoring.

Kahn (2001) conducted a national survey with 149 counseling psychology doctoral students from 12 randomly selected APA accredited universities. The study involved the administration of six instruments. The instruments were the Investigative Subscale of the Vocational Preference Inventory, Form B (VPI-B; Holland, 1985), the short form (18 items) of the RTES-R (Gelso et al., 1996) developed by Kahn and Miller (RTES-R-S; 2000), the short form of the SERM (Phillips & Russel, 1994) developed by Kahn and Scott (1997), the ROEQ (Bishop & Bieschke, 1998), the IRQ (Bishop & Biescke, 1998), the Scholarly Activity Scale (SAS; Kahn & Scott, 1997), and the Mentoring Functions Scale (MFS; Noe, 1988).

The internal consistency reported for the instruments was .62 for the VPI-B, .85 for the RTES-R-S, .88 for the MFS, .89 for the SERM, .88 for the ROEQ, .91 for the IRQ, and .70 for the SAS (Kahn, 2001). The sample consisted of 75% females. The results identified that the participants' relationship with their mentors did not predict research self-efficacy and research interest, but the overall research training environment was a good predictor. Kahn noted that a limitation with his study was that the participants might have identified a mentor that was influential in their development as a practitioner but not so much as a researcher.

Briggs and Pehrsson (2008) surveyed 139 assistant professors in counselor education from CACREP universities. The study involved the use of the Research Mentor Quality Questionnaire (RMQQ), which was developed by the authors for the study. The RMQQ is a 19-item non-Likert response questionnaire. Response items consisted of yes/no responses and multiple choice responses. The RMQQ contains two sections, one that addresses instructional

functions of mentoring and another that addresses relational functions of mentoring. The instructional functions section includes items that address guidance and instruction of research-related activities and career-related guidance. The relational section addresses the mentor-protégé relationship and involves such items as perception of support and nurturing within the mentoring relationship. The purpose of the study was to examine the mentoring experiences of assistant professors in counselor education. No internal consistency was reported by the authors on the RMQQ. The results of the study state that 77% ($n = 107$) of the participants reported receiving research mentoring. A total of 84 participants described the mentoring process as cooperative. A limitation was the design of the questions in the questionnaire identifying research mentorship. The item responses were not the same structure for all the questions (i.e., some items were yes/no while other items were multiple choice answers). An implication was that it provided an understanding of the mentoring processes that exist for pre-tenured counselor educators.

Hollingsworth and Fassinger (2002) conducted a study involving 194 third- and fourth-year counseling psychology doctoral students in 25 APA schools. The instruments used in the study were a modified 16-item version of the RTES–R (Gelso et al., 1996), the Research Mentoring Experiences Scale (RMES; an instrument created by the authors for the purpose of the study), and the SERM (Phillips & Russell, 1994). The study included a 4-item questionnaire called the Past Attitudes Toward Research (PATR; Royalty et al., 1986), which is intended to measure students' recalled interest in doing research prior to doctoral students. The PATR response items are a 5-point Likert response that range from *strongly disagree* to *strongly agree*. Research productivity was measured using an unnamed 8-item questionnaire developed by Kahn

and Scott (1997). The internal consistency for the items was .87 for the RTES-R, .74 for the RMES, .87 for the SERM, .89 for the PATR, and .75 for the 8-item Kahn and Scott's (1997) questionnaire. The results of the study showed that students' mentoring experiences were good predictors of research productivity.

There was a strong correlation between the research training environment and the research mentoring experience of students (Hollingsworth & Fassinger, 2002). Mentoring was shown to mediate the relationship between the research training environment and research productivity. In other words, a research training environment that promotes research productivity is more likely to have mentoring relationships that will reflect that. Research self-efficacy was also shown to act as a mediator between the research training environment and research productivity. A limitation was that it was administered with doctoral students who were all in the later part of their doctoral studies and not early in their doctoral studies. A recommendation for future research was that a cross-sectional analysis could be examined with students who were in their first year of studies and students who were in the last few years of their studies. A benefit of the study showed was the finding that mentoring relationships can have an impact on research productivity for students.

Rose (2003) developed the Ideal Mentor Scale (IMS) for the purpose of identifying what values graduate students seek in a faculty member. A total of 712 doctoral students from three different universities were selected for the study. A pilot study had been conducted prior to this study. The pilot study contained 82 of the 712 participants. The IMS is a 34-item 5-point Likert scale instrument. A factor analysis was administered for the instrument, and it yielded three factors. The internal consistency for each of the three factors for the pilot study and current study

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were .90 and .89 for factor one, .88 and .87 for factor two, and.81 and .79 for factor three. The results identified that the most predominant qualities students desired in a mentor were open communication and feedback. The collegial aspect of the mentoring relationship was not as important to the participants as the communication and feedback about their scholarly development. A limitation was that demographic differences (i.e., age, gender, ethnicity, etc.) were not taken into account when analyzing the results. Rose (2003) recommended that further investigation be conducted to examine such differences. A benefit of the study was that a systematic method can be used for students in pairing themselves with a mentor as opposed to approaching the process clumsily.

Rawls (2008) examined research self-efficacy and mentoring with a convenience sample of 577 doctoral student members of the ACES. The study involved the use of the SERM (Phillips & Russell, 1994), the RMES (Hollingsworth & Fassinger 2002), and the Occupational Commitment Scale (OCS; Meyer et al. (1993). Results identified that the participants reported high levels of research self-efficacy and occupational commitment. The participants reported low quality mentoring experiences such as not having a research mentor or being paid very little attention by their mentors. The study indicated that with regard to occupational commitment, positive scores on the RMES were better predictors than scores on research self-efficacy. Higher RMES scores predicted lower research self-efficacy scores. In other words, students who reported stronger mentoring experiences had lower research self-efficacy scores. A limitation was that there was no information available on the mentors themselves or why students who rated them poorly had done so. The study did contribute to the understanding of the importance

of mentoring research relationships in the professional develop of counseling education doctoral students.

Gattis (2008) investigated the perceptions of mentoring relationships with 219 doctoral level students from a Midwestern university. The study also sought to examine how the participants perceived the overall quality of the mentoring relationship. The participants were selected from different disciplines. The instrument used was the Alleman Mentoring Activities Questionnaire (AMAQ; Alleman & Clarke, 2002). The AMAQ is a 77-item questionnaire with 5-point Likert response. Additional instruments used were the Ideal Mentoring Scale (IMS; Rose, 2003) and the Relational Health Indices (RHI; Liang et al., 2002), which is a 37-item self-report questionnaire. The internal consistency for the AMAQ was .98. The Cronbach's alpha was .93 for the IMS and .96 for the RHI. The participants were asked to complete the instruments based on their current mentoring relationship. Results identified that the participants' perceptions of the ideal mentor were based more on what they believed they were receiving from their mentor as opposed to what the mentor should be providing. Overall, the demographic information (e.g., age, gender, etc.) were not shown to have significant impacts on the doctoral students' perceptions of the ideal mentor. There was a noted difference between males and females participants. For female participants, there was a positive predictive relationship between their perceived perceptions of the ideal mentor and the relational health of the mentor relationship. A limitation was that it was conducted at only one university. Gattis reported that there was limited diversity of the sample with regards to ethnicity. Over 71% of the participants were of Caucasian descent. Implications were that doctoral students need to match their training needs with mentors who have qualities that are best suited for them. The reverse was also

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recommended by Gattis for mentors partaking in a mentor-protégé relationship; mentors need to be aware of whether or not they are well suited for the protégé.

Black (1998) developed and validated the *Mentor Functions Scale* (IMS) for Counselor Education. The IMS is a 96-item 5-point Likert response survey. The item responses range from *not at all important* to *exceptionally important*. A total of 229 doctoral students in Counselor Education participated in the study. The internal consistency for the instrument was reported to be 0.97. A factor analysis yielded a four factor model that included the following factors: (a) sponsoring, (b) encouraging, (c) teaching and (d) counseling. The results indicated that the function of sponsoring was the most important factor for participants. The function of sponsoring included such activities as involving students in research projects, doing co-presentations, and assisting clients in networking with other professionals in the field. A limitation noted by the author is that there were no distinctions made between mentor functions and mentor behaviors. An implication was that it served to identify functions that are beneficial for students in a mentoring relationship. The function of sponsoring by mentors was deemed to be the most important mentor function for protégés.

In a study by Jones (2006), the RMES (Hollingsworth & Fassinger, 2002) was used with a sample of 121 counseling psychology doctoral students in their second year or later of an APA accredited program. The study investigated peer and faculty mentoring experiences of doctoral students in counseling psychology. Additional measures used in the study were the RSES-R (Greeley et al., 1989), 12 questions developed by Kahn and Scott (1997) to evaluate research productivity, the Graduate Student Satisfaction Questionnaire (GSSQ; Field & Giles, 1980), the Satisfaction with Life Scale (SWLS; Diener, Emmons, Larsen, & Griffin, 1985), and the IRQ

(Bishop & Bieschke, 1994). The internal consistency for the RMES was .90 for the peer research mentor version and .94 for the faculty research mentor version. The internal consistency was .97 for the RSES-R, .73 for the 12 questions of Kahn and Scott (1997), .94 for the GSSQ, .86 for the SWLS, and .94 for the IRQ.

Of the total participants, 85.1% reported having only a faculty research mentor while 30.6% reported having both a faculty and peer research mentor (Jones, 2006). The results of the study identified that satisfying research mentoring experiences only predicted satisfactory graduate training and not research productivity. A limitation was the participants' identification of their respective faculty research mentors. Jones noted that participants might have rated a mentor that was not mentoring the participants in research but in other areas of development such as psychosocial. The study did not include participants who were in their first year of doctoral study and therefore might present a completely different perception of mentoring than a study that uses students in later years of their doctoral study.

Noe (1988) examined the characteristics of protégés in the mentoring relationship. The purpose of the study was to examine the specifics of the effect of mentor assignment on the mentoring relationship. The study used Lodahl and Kejner's (1965) 20-item scale to assess protégés' job involvement. The scale contains 5-point Likert response items. The internal consistency was .72. Locus of control was assessed using an 11-item measure developed by Andrisani and Nestle (1976) that includes a 4-point response items from *strongly disagree* to *strongly agree*. The internal consistency for the Andrisani and Nestle instrument was .67. Career planning was measured using Gould's (1979) 6-item measure. The internal consistency for Noe's study was .89 for Gould's 6-item measure. Mentoring functions were measured using a 32 item

questionnaire created by the author for the purpose of the study. The items included a 5-point

Likert response with responses ranging from *to a very slight extent* to *a very large extent*. The

internal consistency for the 32 item measure was .89 for mentor functions that were career-

oriented and .92 for the relational mentor functions. Noe's study included asking mentors how

many hours involved they are with their protégé and how often does the protégé make use of

their services. The mentors were not administered the same instruments as the protégés in the

study.

Results identified that the protégés reported receiving more benefits in the mentoring

relationship that were more psychosocial in nature (e.g., relational, teaching, etc.) than career-

related functions (e.g., counseling on career decision, support; Noe, 1988). The mentors in the

study reported that female protégés take advantage of the mentoring relationship more so than

male students. A limitation was that the focus was more on the perception of the protégé than on

the perceptions of the mentor. An implication was the identity of two major functions that a

research mentor serves which are: a) career related and b) psychosocial. Mentors work with

students in professional development, but they also serve as a means of support while the

students are going through that development.

Summary

This chapter reviewed relevant research on research productivity of counseling

professionals and doctoral students. The chapter presented the importance of research and how it

impacts the counseling profession. The literature on research productivity further examined how

the importance of research affects doctoral students' levels of research productivity. Included in

chapter two was an exploration of the research addressing the constructs of research self-

efficacy, interest in research, and the research mentoring environment. The intent of chapter two was to present the theoretical foundations for the present study. In the next chapter, the methodology of this study will be discussed.

CHAPTER THREE: METHODOLOGY

Chapter three is a presentation of the methodology used in this study. The chapter 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, interest in research, and perceptions of the research mentoring environment with a national sample of counselor education doctoral students ($N = 261$). Of the total 261 participants, 18 participants consisted of mailed-in surveys, and the remaining 243 were from electronic responses. There were an additional 107 surveys that were excluded from the data analysis on the electronic survey for having an incomplete response from the participants or for the participants attending a non-CACREP program. The construct of Research Self-Efficacy was measured by the *Research Self-Efficacy Scale – Revised* (RSES; Greeley et al., 1989). The construct of Interest in Research was measured by the *Interest in Research Questionnaire* (IRQ, Bieschke & Bishop, 1994). The construct of the perceptions of the research mentoring experience was measured by the *Research Mentoring Experiences Scale* (RMES; Hollingsworth & Fassinger, 2002). The study also investigated if differences existed between research self-efficacy, interest in research, and perceptions of the mentoring experiences of doctoral students in counselor education with respect to demographic makeup. The first demographic variable of interest was the year of doctoral counselor education preparation program. The education level of the participants was

evaluated separately from the other demographic variables since research question two considered whether or not there was a difference in the three constructs of interest (research self-efficacy, interest in research, and research mentoring) based on year of doctoral studies. The remaining demographic variables were evaluated separately from the year of doctoral education. In order to evaluate the differences, the demographic characteristics of the participants were treated as independent variables, and the constructs of research self-efficacy, interest in research, and perceptions of mentoring experiences were treated as dependent variables.

The demographic information consisted of the following: (a) year of doctoral study, (b) age, (c) gender, (d) race/ethnicity, (e) highest degree completed, (f) post-graduate experience, (g) cohort model, (h) area of counseling specialization, (i) scholarly activity (i.e., publications and presentations), (j) number of doctoral level research courses taken, (k) location of program (i.e., state), (l) professional aspirations, and (m) participants rating of their own research competency, (n) rating of interest in research, (o) rating of research self-efficacy, and (p) rating of current mentor. The last three demographic variables were on 4-point scale.

The research design is quantitative and the data analysis methods were Multiple Linear Regression (MLR), Pearson's correlation coefficient, and analysis of variance (ANOVA). Additionally, Structural Equation Modeling (SEM) was utilized as a confirmatory procedure to confirm the results of the MLR procedures. The study intended to analyze the demographic information of the participants and potential differences of the demographic information and the constructs of research self-efficacy, interest in research, and the research mentoring environment. It includes descriptive statistics on the participants' demographic information.

Research Design

The research methods employed in this study were an ex-post facto, cross-sectional, and correlational design. The researcher wanted to evaluate the variables as they took place in their natural occurrence (i.e., they were not manipulated). Ex-post facto research, which is also known as causal-comparative research, examines variables in their currently existing state or past occurrence (Best & Kahn, 2006). Correlational research has the principle function of understanding the relationship between two or more variables without having to control or manipulate the variables in any way (Fraenkel & Wallen, 2003). Correlational research determines the strength of the relationship between the variables and the direction of that relationship (i.e., positive or negative; Ary, Jacobs, & Sorenson, 2010). In addition, "a descriptive, correlational design does not infer causal relationships and is, therefore, more conducive to purposive sampling" (Lambie, Smith, & Ieva, 2009, p. 120). Since the constructs of interest (i.e., research self-efficacy, interest in research, research mentoring, and demographic variables) were not manipulated by the researcher, this method was deemed appropriate. The variables of research self-efficacy, research interest, and research mentoring were operationalized as continuous variables. Continuous variables do not have a fixed point on a range of numbers (Ary et al., 2010). Continuous variables allow the measurement of the degree and magnitude of the relationship between the variables. A correlational research design was selected for the study. The rationale for selecting this research design was that the researcher wanted to determine the relationship between research self-efficacy, interest in research, and research mentoring. Research self-efficacy was defined as the dependent variable, and interest in research and research mentoring were labeled as independent variables.

Of interest to this researcher was the exploration of possible changes that might exist when comparing first-year counselor education doctoral students with those in their second year, third year, or higher on research self-efficacy, interest in research, and research mentoring. Since this researcher wanted to determine the differences across these groups, an ex-post facto research and cross-sectional design was used in order to evaluate the differences between these groups. In ex-post-facto research, the groups that are evaluated are not pre-assigned or randomly assigned. Groups in ex-post-facto research already differ with respect to one or more of the variables of interest (Crowl, 1996).

In this study, the variables of research self-efficacy and interest in research and research mentoring were utilized as dependent variables, and the year of doctoral study was utilized as the independent variable. It was the interest of this researcher to investigate the relationship that may exist between doctoral counselor education students' research self-efficacy, interest in research, and the research mentoring experiences, which included demographic information (age, gender, education level, scholarly activity, race/ethnicity, location, specialization, doctoral-level research courses taken, professional aspirations, self-rating of research competency, rating of interest in research methodology and rating of research mentor). For the purpose of this study, the demographic variables were utilized as independent variables, and research self-efficacy, interest in research, and research mentoring were operationalized as dependent variables. The selection of the demographic variables was based on studies that demonstrated that the demographic information was related to the outcome variable of interest in research (e.g., Bard, 2000; Bishop, 1995; Kahn & Scott, 1997; Lambie & Vaccaro, 2011).

The current study incorporated an ex-post-facto, cross-sectional, and correlational design in order to analyze the research questions and hypothesis. The Statistical Package for Social Science (SPSS) software package for Windows version 17.0 (2008) was used for this purpose. For the purpose of the statistical analysis comparing the three constructs of interest, research self-efficacy (Greeley et al., 1989) was treated as the dependent variable, and interest in research (Bishop & Biescke, 1994) and research mentoring experience (Hollingsworth & Fassinger, 2002) were treated as the independent variables. Additionally, the demographic characteristics of the participants in the study (age, gender, education level, scholarly activity, race/ethnicity, location, specialization, doctoral-level research courses taken, and professional aspirations, self-rating of research competency, self-rating of interest in research methodology and self-rating of research mentor) were included in the analysis on their effects on the three constructs of interest (i.e., research self-efficacy, interest in research, and research mentoring). The demographic variables were treated as independent variables, and the constructs of interest were treated as dependent variables. The statistical procedures to analyze the variables are discussed next.

Statistical analysis in the study included the Pearson product moment correlation (r) (two-tailed) for the purpose of determining the relationship between the variables of interest, which were (a) research self-efficacy, (b) interest in research, and (c) research mentoring experience. An ANOVA was applied with the intent to determine if there were statistical differences among the variables of interest, the level of education of doctoral students, and the previously mentioned demographic information. Pearson correlation coefficients denote the strength and direction of the relationships between variables. The Pearson coefficients values range between -1.0 and + 1.0. The value of -1.0 indicates a perfect negative relationship, and the

value of +1.0 indicates a perfect positive relationship between variables. The purpose of the ANOVA is to determine the amount of variance that occurred between the dependent variable and the independent variables (Lomax, 2007). The research questions examined the relationship among the three constructs (i.e., research self-efficacy, interest in research, and research mentoring), and the relationship among the three constructs of interest and the demographic variables. The three research questions are presented next.

Research Questions and Hypotheses

Research Question 1

Do doctoral counselor education students' perception of research mentoring (as measured by the *Research Mentoring Experiences Scale*) and their reported interest in research (as measured by the *Interest in Research Questionnaire*) predict their scores in research self-efficacy (as measured by the *Research Self-efficacy Scale*)?

Research Null Hypothesis 1

Interest in research (as measured by the *Interest in Research Questionnaire* [IRQ]) and perceptions of research mentoring (as measured by the *Research Mentoring Experiences Scale* [RMES]) do not predict counselor education doctoral students' reported research self-efficacy (as measured by the *Research Self-efficacy Scale* [RSES]).

Research Question 2

Does a difference exist among doctoral counselor education students in terms of their years of preparation (1st year, 2nd year, and 3rd year and beyond) with respect to their degree of research self-efficacy (as measured by the *Research Self-efficacy Scale*), interest in research (as

measured by the *Interest in Research Questionnaire*), and research mentoring (as measured by the *Research Mentoring Experiences Scale*)?

Research Null Hypothesis 2

No statistically significant difference exists among counselor education students based on their year of preparation (1st year, 2nd year, and 3rd year and beyond) with respect to their scores in research self-efficacy (as measured by the *Research Self-efficacy Scale-Revised* [RSES-R],) interest in research (as measured by *Interest in Research Questionnaire* [IRQ]), and research mentoring (as measured by the *Research Mentoring Experiences Scale* [RMES]).

Research Question 3

Do counselor education doctoral students' differ in research self-efficacy (as measured by the *Research Self-efficacy Scale*), reported interest in research (as measured by the *Interest in Research Questionnaire*), and perceptions of research mentoring (as measured by the *Research Mentoring Experiences Scale*) with respect to various demographic variables (i.e.., age, gender, scholarly activity, specialization, doctoral-level research courses taken, and professional aspirations, etc.)?

Research Null Hypothesis 3

Counselor education doctoral students' do not differ in research self-efficacy (as measured by the *Research Self-efficacy Scale*), reported interest in research (as measured by the *Interest in Research Questionnaire*), and perceptions of research mentoring (as measured by the *Research Mentoring Experiences Scale*) with respect to various demographic variables (i.e.., age, gender, scholarly activity, specialization, doctoral-level research courses taken, and professional aspirations, etc.)

Is the relationship observed of the effect of research mentoring (as measured by the *Research Mentoring Experiences Scale*) on research self-efficacy (as measured by the *Research Self-efficacy Scale*) improved using structural equation modeling due to its correction for measurement error in the instruments?

Research Null Hypothesis 4

The results of the structural equation modeling does not improve the relationship of research mentoring (as measured by the *Research Mentoring Experiences Scale*) on research self-efficacy (as measured by the *Research Self-efficacy Scale*) due to its correction for measurement error in the instruments.

Population and Sampling Plan

The population of interest for this study consisted of counselor education doctoral students' enrolled in CACREP accredited programs across the nation. Non-CACREP programs were not included in the study since this researcher was interested in the constructs of interest (i.e., research self-efficacy, interest in research, and research mentoring) and how they related to CACREP students. To be able to ascertain the information on the population of interest, the participants in the study consisted of counselor education students who were in their first year, second year, and third year and beyond of their respective doctoral training. All 59 CACREP-accredited counselor education doctoral programs were contacted to participate in this study, and 24 programs agreed to participate. Of the 24 programs that agreed to participate in the study, 22 programs requested electronic administration of the survey instruments, and the remaining two programs requested hard copy mailing of the survey packets.

Once approval was received from the Institutional Review Board (IRB) of the University of Central Florida, two procedures of the administration of the survey packets took place. For the two programs that requested hard copy mailed packets, survey instruments containing the data collection instruments (90) were mailed to the program coordinators for distribution. For the remaining 22 program coordinators, an electronic website with the survey was created. Electronic and web-based surveys have the advantage of being more convenient for the participant and are administered in a timely fashion, allowing for quick receipt of responses. Some major disadvantages of electronic and web-based surveys are the technological proficiency of the participants and the exclusion of personal contact on the part of the researcher to the intended participants (Evans & Mathur, 2005). Prior notification to participate in survey research is similar between mailed surveys and web-based surveys provided the participants in the study have complete access to the internet (Kaplowitz, Hadlock, & Levine, 2004). The participants in the study would not have been able to complete the electronic survey if they did not have a valid e-mail address. Participants in the study were provided an option of completing the survey instruments via the electronic method or completing a hard copy mailed version if they preferred to complete the survey via standard mail method.

The program coordinators were once again contacted and provided the electronic link to the survey. The sampling procedure utilized for this study was purposive sampling. A purposive sampling plan is suitable for this study since there are characteristics the participants have that the researcher is interested in studying (e.g., year of doctoral preparation). Purposive sampling is non-probability sampling; the intent of purposive sampling is to select participants who best match the characteristics of the population of a whole and to obtain a large enough sample size

where random sampling may not be practical (Crowl, 1996; Gliner & Morgan, 2000; Sproull, 1995).

Response rates for studies can determine overall sample size. Lambie and Vaccarro (2011) mailed out 141 survey packets in their study and received 89 completed surveys for a response rate of 63.1%. Kahn and Scott (1997) reported a response rate of 55% in their study. Kahn and Schlosser (2010) sent invitations to participate in their study to120 PhD programs (e.g., clinical psychology, counseling psychology, and school psychology) and received an overall response rate of 35%. As demonstrated by these studies, similar responses would be anticipated for participant response rates or program response rates for this study. The exact number of potential participants was not available to provide an estimate for sampling purposes. Only three programs reported the number of students in their respective programs. Inferences to the total population could not be made without being able to make a decision on selecting a suitable sample size for the study. The process of deciding on the appropriate sample size is dependent on three things: (a) the power of the study (i.e., $1 - \beta$; the probability of rejecting a false null hypothesis, not making a Type II error, or not making a negative decision), (b) the effect size, and (c) the level of significance (Lomax, 2007). Setting the power at 80% at the .05 confidence level is the smallest amount acceptable for rejecting a false null hypothesis (Gliner & Morgan, 2000). Another measurement to consider is the effect size, which is a measure of the relationship between two variables (Ary et al., 2010). Cohen (1992a) provides measurements on effect size that can be small (.10), medium (.30), or large (.50). The final things to consider for power are the level of significance (or alpha level) and the confidence interval. An alpha level of .05 is standard for the majority of studies. The confidence level is the range of what the

researcher believes scores from the population will fall. A standard for confidence levels is usually 95% (Field, 2005).

In order to determine the sample size, the statistical analysis used was an ANOVA. An ANOVA determines the mean difference between groups (Gall, Gall, & Borg, 2007); in this study, that means comparing first-year doctoral students to doctoral students in their second year, third year, and beyond. Using Cohen's (1992a) chart, the minimum sample size needed for this study would be 85 based on a power of 80%, a level of significance of 5%, and an effect size equal to $r = 0.3$. In order to ensure the minimum sample size, the research sought to obtain a sample of 170 participants owing to response rates of 50% in related studies (e.g., Lambie & Vaccarro, 2011; Kahn & Scott, 1997). The next section discusses the instruments used to evaluate the constructs of interest (i.e., research self-efficacy, interest in research, and research mentoring) and the demographic variables of the participants.

Instrumentation

The study included four data collection instruments. The purpose of dispensing the instruments was to serve as a means of collecting the information needed to inspect the research questions and hypotheses that were foundational in this study. The four instruments were (a) the Demographic Questionnaire, (b) the Research Self-Efficacy Scale, (c) the Interest in Research Questionnaire, and (d) the Research Mentoring Experience Scale. The next section presents an introduction and brief appraisal of these instruments.

General Demographic Questionnaire

To gain information on the participants in the study, a two-page demographic survey was developed by the researcher. The demographic survey asked participants to input general

information on location of program (i.e., state of program), their year in program, gender, race/ethnicity, age, year of post-graduate experience, scholarly activity, doctoral research courses taken, career aspirations (i.e., professor, private practice, etc.), participants' rating of their own mentoring experience, participants' rating of their research self-efficacy, and participants' rating of their own interest in research. The demographic questionnaire and the three instruments were administered to the doctoral students via mailed method (90 packets) and survey website. The demographic questionnaire and the three instruments (RSES-R, IRQ, and RMES) were reviewed by the researcher's dissertation committee prior to beginning the study. The committee provided the researcher feedback regarding administration of the demographic form and instruments. The demographic form was included in the study once it was approved

The Research Self-efficacy Scale-R (RSES)

The *Research Self-efficacy-Revised Scale* (RSES) is a 38-item instrument that was developed by Greeley et al. (1989) and was designed to measure an individual's believed confidence of his or her own ability to carry out an assortment of research tasks (e.g., conduct literature reviews, design a research study including make appropriate statistical analysis, perform a study, etc). The RSES consists of participant responses to each question. Response items range from 0 (not confident) to 100 (totally confident) and comprise an 11-point scale. The participants were instructed to rate their response to each item based on the scale response. See Appendix C for a representation of the RSES-R. Bieschke, Bishop, and Herbert (1995) and Bieschke, Bishop and Garcia (1996) reported a high internal consistency of .96 for the RSES. Bieschke and colleagues (1996) performed a hierarchal regression analysis and found that the three subscales of Early Tasks, Conceptualization, and Implementation accounted for the most

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variance of research interest predicting research involvement. Lambie and Vaccarro (2011) reported an overall alpha coefficient score of .96 for the RSES.

Forester, Kahn, and Hesson-McInnis (2004) completed a factor analysis on the RSES and determined that it contained good internal consistency (.98 Cronbach's alpha). The study consisted of 1,004 graduate students in psychology-related programs like clinical psychology, school counseling, and others. Standardized first-order factor loading results of the RSES ranged from .48 up to .87. The second-order standardized factor loadings of the RSES ranged from .75 up to .95. Forester and colleagues recommended that increasing research self-efficacy can be facilitated through a strong mentoring relationship.

Faghihi (1998) conducted a study with doctoral candidates ($N = 97$) from different disciplines in education. The disciplines consisted of Counseling, Educational Psychology, Instruction and Curriculum in Leadership, and Leadership. The purpose of the study was to examine students' dissertation progress in relation to factors such as demographic backgrounds, research activities, and research self-efficacy. The internal consistency for the RSES was reported to be .95 in the study. Results of the study found that students' research self-efficacy and relationships with their advisors significantly contributed to dissertation progress. A limitation of the study was that it used a convenience sample from one university. However, the study did contribute to the understanding of the connection between research self-efficacy and the mentoring relationship for doctoral students. The following section provides research related to the IRQ.

Interest in Research Questionnaire

The IRQ was developed by Bishop and Bieschke (1994). The IRQ is a 16-item 5-item Likert response scale that contains responses that range from 1 (very disinterested) to 5 (very interested). The IRQ contains response items on different research activities. The participants are instructed to provide a response to each item based on the range of the scale. IRQ items ask participants to provide a ranking of a research activity (e.g., reading about research, being involved in a research study including data analysis, etc.). The purpose of the IRQ is to provide a score on individuals' interest in research-related activities. The IRQ is provided in Appendix A. The IRQ has proven to be a reliable instrument in studying interest in research and factors that influence it such as research self-efficacy (e.g., Vaccaro, 2009). Bishop and Bieschke (1998) reported internal consistency for the IRQ to be .91 ($N = 184$).

Love and colleagues (2007) conducted a study with 131 doctoral students in APA-accredited schools in which they reported the internal consistency for the IRQ to be .93. Bard and colleagues (2000) analyzed data from two studies ($n = 223$) for the purpose of investigating research interest among doctoral students and faculty. Lambie and Vaccaro (2011) surveyed 89 doctoral students in counselor education and reported the internal consistency of the IRQ to be .93 in their study. They found that the IRQ in those studies was .89 and .90 respectively. Jones (2006; $N = 143$) found that the IRQ had an internal consistency of .94. Studies demonstrating the psychometric properties of the IRQ and the RSES were detailed in the last two sections. This section reviewed the literature on the *Interest in Research Questionnaire* (IRQ). The following section provides information about the research related to the Research Mentoring Experience Scale (RMES).

<u>Research Mentoring Experience Scale (RMES)</u>

The *Research Mentoring Experience Scale* (RMES; Hollingsworth & Fassinger, 2002) is a 28-item scale. The purpose of the RMES is to measure respondents' perceptions with regard to their research mentoring experience**.** The RMES is a new instrument compared to the RSES and the IRQ and thus does not have as extensive research on the internal consistency. This instrument is provided in Appendix B for illustration.

Rawls (2008) utilized the RMES with a convenience sample of 577 student members of the Association for Counselor Education and Supervision (ACES). The researcher found that students who reported higher degrees of research self-efficacy reported lower research mentoring experiences with the inverse being true for students who reported lower degrees of research self-efficacy had stronger research mentoring experiences. Positive mentoring experiences, according to Rawls, increase research self-efficacy. Rawls did not report a Cronbach's alpha score in her study using the RMES.

Hollingsworth and Fassinger (2002) examined the RMES with 194 third- and fourth-year counseling psychology doctoral students. The authors reported a Cronbach's alpha of .74. Results of the study found that students' mentoring experiences serve as good predictors for research behavior (i.e., scholarly publications, presentations, etc.). Students who reported positive mentoring experiences were more likely to engage in research activities.

Jones (2006) used the RMES with a sample of 121 counseling psychology doctoral students in their second year or later in an APA-accredited program. Jones reported a Cronbach's alpha of .90 in this study for the peer research mentor version and .94 for the faculty research

mentor version. The results of Jones' study indicated that satisfying research mentoring experiences only predicted acceptable graduate training and not research productivity.

The above section discussed the available research on the psychometric properties of the RMES. As noted, there is limited research on the internal consistency of the RMES. In the three studies mentioned, the internal consistency for the RMES ranged from .74 (Hollingsworth & Fassinger, 2002) to .94 (Jones, 2006), and one study (Rawls, 2008) did not report the internal consistency of the item in the study. The next section provides information about the data collection methodology for the current study.

Data Collection

A list of all the prospective CACREP schools was obtained from the CACREP website on the available PhD programs in Counselor Education. According to the CACREP website, there are a total of 59 Counselor Education doctoral programs throughout the country. A list of all the respective program coordinators was compiled. All of the program coordinators were contacted through e-mail correspondence. A request was made to ask each program coordinator to serve as point of contact for the study. A cover letter was attached to each e-mail along with a copy of the informed consent and the IRB approval letter. The researcher contacted each CACREP program coordinator and requested to know the number of doctoral students enrolled in for the purpose of arranging the appropriate number of mailed packets. In addition to contacting program coordinators, an invitation to participate in the study was made via two ListServs. This researcher followed up with requests to the program coordinators for participants and placed periodic reminders on the two ListServs. Of the total 59 programs, 24 programs agreed to participate in the study. There were only two program coordinators of the 24 who

requested standard mailed method for delivery of the survey packets. The remaining 22 programs coordinators requested the survey packets be administered via electronic format.

In order to obtain additional participants, an electronic version of the survey packet was created. The electronic version of the survey packet included the informed consent at the beginning of the survey. Participants were instructed in the electronic version to read the informed consent before proceeding to the next step. Participants were instructed to please read this (i.e. informed consent) before you proceed to the next step. After you have read the informed consent, by "clicking on next" indicates my understanding of this study and my consent to participate. The electronic survey was tested by this researcher prior to releasing the link to ensure that the survey was working properly. Once the survey was found to be working properly, the electronic link was released to the program coordinators directly and through the two Listservs.

For the data collection process of this study, a cover letter explaining the purpose of the study and a letter of informed consent was emailed to the respective program coordinators. A copy of the cover letter and informed consent was also included in the e-mails sent on the Listserv. Included in the emails was an attachment of the survey questionnaires that contained the demographic questionnaire, the RSES-R, the IRQ, and the RMES. Data collection packets were mailed to the two programs who requested standard mail method for administration of the surveys. A one-dollar bill was included in the hard copy packets that were mailed out (90) as an incentive as per the survey research guidelines of Dillman, Smyth, and Christian (2009). Dillman and colleagues recommend the use of other incentives for internet surveys (e.g., gift cards, random drawings, etc.) since sending a dollar bill via e-mail is not practical. The internet survey

did not include an incentive. There were a total of 56 responses returned after the first two weeks the internet survey was started. The researcher encountered a technical issue from the internet survey that prevented the original 56 respondents from receiving all the survey questions. A follow-up response was sent to each of the original 56 respondents after the technical issue was resolved. To keep consistent with additional respondents, no incentives were offered after the researcher received the initial 56 responses. Instead, both a global sent e-mail via the survey website and personal e-mail were sent out to participants asking if they were interested in receiving the one-dollar bill as an incentive to participate in the study. The rationale for this method was to maintain consistency throughout the study.

After obtaining IRB approval, the survey was implemented using the design method recommended by Dillman and colleagues (2009) for web-based surveys. One recommendation by Dillman and colleagues was to use mixed-modal contacts to increase response rate since various factors (e.g., technical proficiency of the respondent) can affect the response rate.

Below are six procedures that Dillman et al. advise in developing web-based surveys:
1. Decide which electronic method is most appropriate for the population (i.e., blank Portable Document Format (PDF) to be completed, e-mail, link, etc.). Depending on the sample size, the chosen method will determine data collection procedures. There are many survey websites that offer direct downloadable spreadsheets or SPSS files of the data.
2. Be aware of the technological proficiency of the sample. Some participants might be more comfortable completing a hard copy form as opposed to logging onto a website. A PDF can be filled out, saved, and sent back to the researcher.

3. Make sure that the questions on the survey read consistently over different user settings, resolutions, etc. since some computer screen resolutions may read the questions differently. Dillman and colleagues recommend using cascading style sheets to account for this issue.

4. Determine the number of questions that each web page will have. If at all possible, try to match the webpage with the paper-pencil version of the survey.

5. Electronic survey methods tend to be less personal than standard mailed surveys, so make every effort to be personal in correspondence to participants. This may include sending out e-mails to participants via the website notifying them to contact the researcher if there are any problems or sending out an e-mail thanking them for completing the survey. The e-mails sent from the survey website are blind carbon copy (Bcc), which ensures confidentiality of the participants.

6. Test the survey before sending it out to the participants to ensure that it works. If participants are unable to access the survey, they will not be able to complete it.

These methods outlined by Dillman et al. (2009) are some of the methods recommended for internet and electronic surveys. The last date to complete the electronic survey and receive the hard copies of the survey packets was determined to be April 2, 2012. Informed consent in the study was determined by the returning of the electronic survey packets via the electronic website to the researcher; this provided confirmation of informed consent by the doctoral student. Students who did not return the research packets were not included in the study. The anonymity of the participants was maintained by not asking for any identifying information on the demographic sheet and survey packets. A number was assigned to each survey packet (i.e., completed demographic and survey packets) in order to maintain the consistency of the

demographic sheets with the survey instruments. 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 17.0 (2008) for data analysis. The completed instruments were kept by the researcher in a locked filing cabinet that only the researcher had access to. Electronic copies of the completed survey packets were kept on a password-protected flash drive which only the researcher had access to.

Data Analysis

There were three statistical procedures used for the data analysis in this study: Structural Equation Modeling (SEM), multiple linear regression (MLA) and ANOVA. The researcher wanted to examine the relationship between the three constructs (i.e. Research Self-Efficacy, Interest in Research, and Research Mentoring Experience) and how the demographic variables can affect scores on the three constructs. Additionally, it was postulated by the researcher that there is a specific relationship between the construct of research mentoring and research self-efficacy. SEM allows the researcher to test theories about relationships that might not otherwise be observed through traditional methodological procedures (Raynov & Marcoulides, 2006).

The researcher applied MLA for the purpose of determining if there was a relationship (i.e., statistical significance) among the variables of research self-efficacy, interest in research, and research mentoring experience. MLA was also use to determine whether or not research self-efficacy scores can predict research mentoring scores and interest in research scores (Research Question 1). The variables in this research question are categorized as continuous variables, making a correlational design appropriate to analyze this research question. The researcher was interested in measuring the degree and magnitude of this relationship (Jaccard & Becker, 2002).

The statistical procedure utilized to evaluate the second and third research questions was MLA. Research Question 2 and Research Question 3 contain categorical variables (e.g., gender, race, location, etc.), which make the use of MLA a suitable choice to evaluate these research questions. The researcher was interested in conducting an analysis using a continuous dependent variable and categorical independent variables (Field, 2005).

The constructs of research self-efficacy, interest in research, and research mentoring experiences were analyzed using MLR in order to determine if a significant relationship existed between the constructs. Understanding the relationship or correlation among the three constructs was of interest for the researcher. Using the statistical procedure of MLR allows the simultaneous testing and modeling of multiple independent variables with a single dependent variable (Ary et al., 2010). MLR involves Pearson's correlation coefficients. Pearson correlation coeffcient is utilized in order to test if there was a statistical significant relationship between two continuous variables. Pearson's correlation was used to determine if such a relationship exists among the independent variables in question (Gliner, & Morgan, 2000). The data analysis included the computation of the correlation of the three constructs of research self-efficacy, interest in research, and research mentoring experiences to determine what relationship existed among the three constructs of interest.

The researcher was interested in determining whether or not there was a significant relationship among the variables of research (self-efficacy, interest in research and the research mentoring experiences). In order for the researcher to make this determination, a multiple regression procedure was implemented. MLR procedures allow for the controlling of independent variables in the model with the purpose of deciding if the effects of the independent

variables on the dependent variable are occurring independently of one other or concurrently

(Tabachnick & Fidell, 2007). The regression equation for the MLR is:

$$Y^{'} = A + B_1X_1 + B_2X_2 + \ldots B_kX_{2k}$$

For research question one, the regression equation used for analysis was:

$$Y^{'} = A + B_1X_1 + B_2X_2$$

In this equation, $Y^{'}$ is the dependent variable of research self-efficacy, A is the Y intercept of the

model (i.e., value of Y when all values of X are zero), B_1 is the coefficient for the independent

variable of interest in research (X_1), and B2 is the coefficient for the independent variable of

research mentoring experience (X_2; Tabachnick, & Fidell, 2007). MLR procedures include the

use of ANOVAs which is used to to establish whether an independent variable (or multiple

independent variables in factorial designs) has a significant impact on a single dependent

variable (Fraenkel & Wallen, 2003). In the ANOVA, the dependent variable is a continuous

variable. Continuous variables are not dichotomous, which means it can take on more than two

values (e.g., yes/no responses). The independent variable is categorical or continuous depending

on the number of independent variables. Categorical values can take on two or more levels (e.g.,

ethnicity, nationality, etc.) or categories, but responses are limited to one of the categories. An

ANOVA allows for more than one independent variable to be tested at the same time (Lomax,

2007; Sproull, 1995).

After all the independent variables have been taken into account in the model, the results

denote if one or more independent variables are explained in the variance of the dependent

variable (i.e., differences in scores). An independent variable can only be considered to account

for variance on the dependent variable if it is found to be of statistical significance (Cohen,

Manion, & Morrison, 2007). The result of using an ANOVA produces an *F*-statistic or *F*-ratio, which is also a test statistic. The *F*-statistic tests the overall model fit. Essentially, it looks at the ratio of the variance of the model that is explained and unexplained. The *F*-statistic demonstrates whether or not the variables in questions have had an effect on each other (i.e., what effect the independent variable(s) had on the dependent variable), but it does not detail the specifics of that effect. The *F*-distribution is demonstrated in two degrees of freedom represented by k-1 and n-k. In this representation, *n* is the sample size and *k* is the number of observations (Field, 2005; Rumsey, 2009). The next section discusses the rationale for conducting the least significant difference (LSD).

The LSD is calculated to determine how the independent variable is related to the dependent variable (provided there is a significant statistical relationship). The overall ANOVA must be significant in order to justify using the LSD. The LSD does not control for Type I errors, which is why additional tests should be chosen. The choice for testing the LSD is usually with the *Bonferroni's test* or *Tukey's* test. Choosing which test to use depends on the number of comparisons the researcher wants to examine (*Bonferoni* for small comparisons and *Tukey's* for larger comparisons). Using either test is good for controlling for Type I errors, but there is a tradeoff in that both tests are limited in their statistical power (Field, 2005)Tukey's test was chosen for the LSD procedure since there were multiple comparisons that the researcher wanted to examine.

The dependent variables for research question number two were research self-efficacy interest in research, and research mentoring, while the independent variable of interest was the year of education of counselor education doctoral students (students who had completed their

first year, second year, or third year or higher of doctoral preparation). The LSD procedure was used to determine which students (year in doctoral preparation program) scored higher on research self-efficacy, interest in research, and research mentoring constructs.

Research question three used the dependent variables of research self-efficacy, interest in research, and research mentoring experiences. The independent variables for research question three were the demographic variables (i.e., age, gender, scholarly activity, race/ethnicity, specialization, post-graduate professional experience, doctoral-level research courses taken, and professional aspirations, self-rating of research self-efficacy; self-rating of research interest and self-rating of research mentor). In order to determine if there were differences between the demographic variables and the three constructs of interest, Multiple linear regression (MLR) was used for each construct and the demographic variables in order to establish if there was a difference between their respective scores on research self-efficacy, interest in research, and research mentoring experiences. The LSD procedure was only utilized if a significant statistical difference was found between the demographic variables (the independent variables in the analysis) and the constructs of interest (research self-efficacy, interest in research and research mentoring).

Research question four examined the reliability of the relationship between research mentoring's effect on research self-efficacy scores. The researcher wanted to determine if the multiple regression results from the relationship between research mentoring and research self-efficacy scores are reliable. The most common methods in the use of SEM are (a) Path Analysis, (b) Confirmatory Factor Analysis, (c) Structural Regression Models, and (d) Latent Change Model. SEM allows for comparisons between one or more independent variables and dependent

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variables that yield a complexity of the relationship that cannot be yielded from multivariate or univariate methods. Confirmatory Factor Analysis (CFA) is used to examine the interrelationsip of variables in the model. CFA is also non-directional (Kline, 2010; Raynov & Marcoulides, 2006; Teo, 2011). The researcher is interested in only the relationship between two variables (in this case, research mentoring and research self-efficacy) and how they interact with each other beyond a simple correlation.

Summary

Chapter three was a detailed description of the methodologies that were used in the current study. As mentioned in chapter three methodologies, the intent of the study was to determine if a significant relationship existed between demographic information and the three research constructs of research self-efficacy, interest in research, and research mentoring experiences. Included in chapter 3 was the research design, research questions and hypotheses, intended population with sampling plan, the instruments used in the study, data collection procedures, and the statistical analysis used in this study. Chapter 4 describes the results and findings of the research based on the statistical procedures outlined in Chapter 3.

CHAPTER FOUR: RESULTS

Overview

Chapter four presents the findings and results of the statistical analysis performed on the variables in the study in order to determine whether there were significant relationships among research self-efficacy, interest in research, and the research mentoring experiences with a national sample of counselor education doctoral students in Council for Accreditation of Counseling and Related Educational Programs (CACREP). The chapter is arranged in the following parts: (a) Overview, Sampling and Data Collection Procedures; (b) Participant Demographics and Descriptive Statistics; (c) Data Analyses and Results for Research Hypotheses/Questions; and (d) synopsis of the results.

Overview, Sampling and Data Collection Procedures

The goal of the research design was to examine the data received from the participants using an ex-post-facto, cross-sectional, correlational research design. Additionally, structural equation modeling (SEM) was used to examine the specific relationship between research mentoring and research self-efficacy correcting for potential unreliability affecting the multiple regression results. The intent of the data analysis utilized in the study was to determine if significant relationships existed among research self-efficacy, interest in research, and research mentoring experiences with a national sample of doctoral students in counselor education. The current study defined the dependent variable as research self-efficacy and the independent variables as interest in research and research mentoring experiences. The demographic characteristics (age, gender, scholarly activity, race/ethnicity, specialization, post-graduate professional experience, doctoral-level research courses taken, and professional aspirations, self-

rating of research self-efficacy, self-rating of research interest and rating of research mentor) were also included in the analysis.

The population of interest consisted of counselor education doctoral students from CACREP accredited programs. The participants were either in their first year, second year, or third year (or higher) in their respective doctoral programs. The participants in the study came from a total of 59 CACREP programs. The participants could only be enrolled in a program that was CACREP accredited. Doctoral students attending non-CACREP programs were not included in the study. Each of the 59 CACREP programs was contacted (via the program coordinators) and invited to participate in the study. Of the 59 CACREP programs contacted, a total of 24 agreed to serve as point of contact for the study for a program response rate of 40.7%. There were a total of 22 of 24 program coordinators who requested that the survey instruments be administered via electronic method. The remaining two program coordinators requested traditional mailed survey packets. For the two programs that requested traditional mailed surveys, a total of 90 survey packets were mailed to the respective programs. A total of 18 surveys were returned (20% response rate) from the 90 packets that were sent out. The survey responses from the electronic website totaled 347. Of the electronic responses, 104 were removed from the analysis for being incomplete or not meeting the criteria for the study. A total of 261 survey responses were received. Of the total 261 participants, 18 consisted of mailed-in surveys, and the remaining 243 were from electronic responses.

The intent of this study was to examine three constructs (research self-efficacy, interest in research, and research mentoring) of doctoral students in CACREP programs. Research self-efficacy was measured by the *Research Self-Efficacy Scale-Revised* (Greeley et al., 1989), which

consisted of values that ranged from 0 (no confidence) to 100 (complete confidence). The construct of interest in research was measured by *Interest in Research Questionnaire* (IRQ; Bishop & Bieschke, 1994), which consisted of values that ranged from 1 (very interested) to 5 (very uninterested). The perception of research mentoring experiences was measured by the *Research Mentoring Experience Scale* (Hollingsworth & Fassinger, 2002), which consisted of values that ranged from N/A (not applicable) to 5 (agree). Upon compilation of the survey results of the three instruments (research self-efficacy, research mentoring, and interest in research), the data was entered into SPSS for analysis in order to construct the scores into a working variable. Scores for each instrument were summed and averaged for each individual in the study to obtain an average score. To obtain an average score, scores for the instruments were added up and then divided by the total number of response items that were on each instrument.

In order to account for missing values on the data analysis, estimates of the mean (Field, 2005) were used in this situation in order to obtain scores for that item. The estimates for the missing values were obtained via the missing values function in SPSS, which provides an estimate for a response item. An alternative procedure would be to use a mean value in place of the missing response item. A representative response for the missing item is imputed, which allows for the participant's response for that item to be included in the analysis. This allows the variability among the participants' responses to be reduced. A reduction in the variability between the participant responses allows researchers to make more accurate estimates (Tabachnick & Fidell, 2007). The variance in the data shows how the scores are spread or distributed about their mean value scores (Sproull, 1995).

In order to determine if the items measuring research self-efficacy, interest in research, and research mentoring were reliable, a reliability analysis was conducted. Reliability analysis was administered by calculating a Cronbach's alpha statistic for each instrument. A Cronbach's alpha score of .70 or higher is considered the standard for good internal consistency (Fraenkel & Wallen, 2003). An observed Cronbach's alpha score of .70 for the three instruments meant that the items research self-efficacy, interest in research, and research mentoring experiences were good measurements of those variables. Scale items correlated well with each other. Intercorrelation of scale items is a good indicator that they are measuring the same variable or construct (Ary, Jacobs, & Sorenson, 2010; Jaccard & Becker, 2002). The variables of research self-efficacy, interest in research, and research mentoring were operationalized as continuous variables for the purpose of running the analysis of variance (ANOVA) and multiple linear regression (MLR) analysis. The last item of the Research Mentoring Experiences Scale (RMES) was removed from the analysis due to the low response rate of the item by the participants (18.4%). An attempt to recover the missing item was made by the researcher from the participants. The missing item was attributed to technical issue on the electronic survey. The reliability analysis results are presented next in Table 1.

Table 1*Reliability Analysis for Research Self-Efficacy, Interest in Research, and Research Mentoring*

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Variable	Cronbach's Alpha	N of Items
Research Self-Efficacy	.978	38
Interest in Research	.939	16
Research Mentoring Experiences	.974	27

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($N = 261$)

Sample Demographics and Descriptive Statistics

The descriptive variables used for the study are presented next. The calculation of the frequencies and percentages of occurrence for each of the categorical (or discrete) variables in the study are displayed. In addition, the frequency tables for each of the variables are presented. The demographic variables included: (a) location of program, (b) year in program, (c) gender, (d) race/ethnicity, (e) age, (f) highest degree completed, (g) type of graduate program completed, (h) Counselor Education degree track, (i) cohort model employed in doctoral program, (j) area of specialization, (k) years of post-graduate counseling experience, (l) did you have research mentor prior to starting program, (m) graduate program completed, (n) number of doctoral research courses taken, (o) career aspirations, (p) scholarly activity, (q) investigator/co-investigator quantitative/qualitative study, (r) self-ratings (i.e., research competency, interest in research, and research mentor). The descriptive statistics are presented below and include the means, standard deviations, and how the variables are distributed throughout a sample (Crowl, 1996). The descriptive statistics consist of the average (or mean) scores for the variables of research self-efficacy, interest in research, and research mentoring. The frequency and percentage of the descriptive statistics are presented in Table 2.

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Table 2 *Descriptive Statistics for Independent Variables Included in the Study*

Variable	Frequency	Percent
Location of CACREP program		
AL	7	2.7%
AR	1	.4%
CO	11	4.2%
DC	1	.4%
FL	45	17.2%
GA	10	3.8%
ID	9	3.4%
IL	16	6.1%
IN	1	.4%
IA	2	.8%
LA	1	.4%
MD	3	1.1%
MI	8	3.1%
MN	5	1.9%
MS	3	1.1%
MO	2	.8%
NJ	4	1.5%
NM	1	.4%
NY	17	6.5%
NC	16	6.1%
ND	1	.4%
OH	26	10.0%
OR	3	1.1%
PA	7	2.7%
SC	4	1.5%
TN	5	1.9%
TX	20	7.7%
VA	30	11.5%
WY	2	.8%
Year in Program		
First Year	54	20.7%
Second Year	60	23.0%
Third Year or Greater	124	47.5%
Not Reported	23	8.8%
Gender		
Female	197	75.5%
Male	62	23.8%
Other/Not Specified	2	.8%

Variable	Frequency	Percent
Ethnicity		
Caucasian/White (Non-Hispanic)	198	75.9%
African-American	29	11.1%
Hispanic	10	3.8%
Asian	8	3.1%
Pacific Islander	1	.4%
Biracial	8	3.1%
Other/Not Specified	7	2.7%
Age		
23-30	81	31.1%
31-40	98	41.3%
41-50	39	14.9%
50+	29	11.1%
Not Specified	4	1.5%
Highest Degree Completed		
M.A.	109	41.8%
M.Ed.	63	24.1%
Ed.S.	7	2.7%
M.S.	47	18.0%
Ph.D.	7	2.7%
Other	28	10.7%
Type of Graduate Program Completed		
M.A. in Counselor Education	90	34.5%
M.Ed. in Counselor Education	39	14.9%
M.S. in Counseling	52	19.9%
M.S./M.A./M.Ed. in Psychology	25	9.6%
Ed.S.	7	2.7%
M.S.W.	8	3.1%
Ph.D.	4	1.5%
Other degree program/Unspecified	36	13.8%
Counselor Education Degree Track		
Ph.D.	222	85.1%
Ed.D.	38	14.6%
Other	1	.4%
Does Program Employ a Cohort Model		
Yes	201	77.0%
No	60	23.0%

Variable	Frequency	Percent
Counselor Education Area of Specialization		
Marriage and Family Counseling	26	10.0%
Mental Health/Community Counseling	132	50.6%
School Counseling	49	18.8%
Counselor Education and Supervision	15	5.7%
Other	39	14.9%
Years of Post-graduate Counseling Experience		
0 - 4 Years	188	72.0%
5 - 9 Years	39	14.9%
10 or more	33	12.7%
unspecified	1	.4%
Did you have a research mentor prior to starting program		
Yes	172	65.9%
No	88	33.7%
unspecified	1	.4%
Number of Doctoral-Level Research Courses Taken		
0	14	5.4%
1-2	61	23.4%
3-4	104	39.8%
5 or more	80	30.6%
Other	2	.8%
Career Aspiration upon Graduation		
Tenure Track/Faculty	170	65.2%
non-Tenure Track Faculty (Instructor)	30	11.5%
Practitioner	28	10.7%
Other	33	12.6%
Scholarly Activity		
Have You Published Any Manuscripts?		
Yes	104	39.8%
No	155	59.4%
Unspecified/not reported	2	.8%
Number of Publications		
0 Publications	155	59.4%
1 - 2 Publications	103	39.5%
3 or more Publications	1	.4%
Unspecified/not reported	2	.8%

Variable	Frequency	Percent
Do You Have any Professional Presentations?		
Yes	162	62.1%
No	97	37.2%
Unspecified/not reported	2	.8%
No of total Presentations		
0-2 Presentations	179	68.6%
3-5	45	17.2%
6-9	13	4.1%
10 or more	22	8.5%
Unspecified/not reported	2	.8%
Investigator / Co-Investigator Quantitative Research		
Yes	118	45.2%
No	141	54.0%
Unspecified/not reported	2	.8%
Investigator / Co-investigator Qualitative Research		
Yes	125	47.9%
No	134	51.3%
Unspecified/not reported	2	.8%
Rating of Research Methodology Competency (scale 1 to 5)		
Rating of 1 - 2	114	43.6%
Rating of 3 - 4	145	55.5%
Rating of 5	0	0.0%
Unspecified/not reported	2	.8%
Average self-rating of research methodology competency = 2.57		
Rating of Interest in Research Methodology (scale 1 to 5)		
Rating of 1 - 2	56	21.4%
Rating of 3 - 4	203	77.7%
Rating of 5	0	0.0%
Unspecified/not reported	2	.8%
Average self-rating of research methodology competency = 3.15		
Rating of Research Mentor (scale 1 to 5)		
Rating of 1 - 2	79	30.3%
Rating of 3 - 4	179	68.5%
Rating of 5	1	0.4%
Unspecified/not reported	2	.8%
Average self-rating of research methodology competency = 2.97		

N = 261

According to the frequency data results that are presented in Table 3, the majority of counselor education doctoral students in the study were female (75.5%, $n = 197$). There were two individuals with one specifying gender as "other" and the second one did not specify on the demographic sheet. The majority of the participants were in their third year or higher (47.5%, $n = 124$) of doctoral study. The first- and second-year students were close in representation (20.7%, $n = 54$ for first year; 23.0%, $n = 60$ for second year). The remaining participants (8.8%, $n = 23$) did not specify their year in their counselor education doctoral preparation program. The age group with the largest number of participants was the 31 - 40 age group (41.3%, $n = 98$) with the next most age group of 23 - 30 (31.1%, $n = 81$). There were a total of four participants (1.5%) who did not specify an age. The average age for the participants was 36.45 years. The majority of the participants' ethnicity was Caucasian/White (Non-Hispanic) (75.9%, $n = 198$). There were a total of 29 states represented from the sample. The most common area of specialization for the participants was Mental Health/Community Counseling (50.6%, $n = 132$) with only 15 participants (5.7%) specifying their area of specialization as Counselor Education and Supervision. The area of reported specialization appeared to contrast with the reported majority for career aspirations, which was Tenure Track/Faculty (65.2%, $n = 170$). The average number of doctoral-level research courses taken was 3.65 research courses. One participant reported taking 12 doctoral research courses. There were a total of 28.8% ($n = 75$) participants who had taken less than three research courses. The majority of the participants (70.4%, $n = 184$) had taken three or more doctoral level courses.

Scholarly activity was diverse depending on publications and professional presentations. The majority of the participants (59.4%, $n = 155$) reported no publications. There were 103 participants (39.5%) who reported having between 1 to 2 publications. The majority of the doctoral students involved in the study reported having presented at regional, national, or international (62.1%, $n = 162$). Of the students who had presented, there were a total of 80 (29.8%) who had three or more presentations at regional, national, international. The majority of the students in the study were in the Ph.D. program regarding the counselor education degree track (85.1% $n = 222$). The majority of the participants (41.8%, $n = 109$) had completed an M.A. degree prior to starting their doctoral studies. Of the students who reported completing an M.A., 90 participants (34.5%) reported that it was in counselor education. There were 39 participants (14.9%) who reported completing a M.Ed. in counselor education. There were 52 participants (19.9%) who reported receiving an M.S. in counseling. The majority of the doctoral students (77.0%, $n = 201$) reported that their program was a cohort model. The average self-rating of students' research methodology competency was 2.57. There were no students who rated themselves a 5 on this demographic question. The majority of participants rated themselves a 3 on research methodology competency (49%, $n = 128$). The rating of 2 was the next most frequent rating on research methodology competency (37.9%, $n = 99$). The average self-rating of the demographic question of interest in research methodology was 3.15. The rating of a 3 (39.8%, $n = 104$) was the most frequent rating with the next most frequent rating of 2 (20.3, $n = 53$). The average self-rating of students' mentors was 2.97. The most frequent self-rating of student research mentors was a 4 (37.5%, $n = 98$), followed by a 3 (31%, $n = 81$). There was one participant who rated their mentor with a 5 (.4%). The remaining descriptive statistic variables

are presented in Table 3. The total scores for each instrument was calculated and divided by the

total number of response items for each instrument.

Table 3 *Summary Statistics for Years of Experience, Research Self-Efficacy, Research Mentoring Experiences, and Interest in Research Scores*

	N	Range	M	SD
Years of Post Graduate Experience before Starting Doctoral Studies	261	0.0 to 25.0	4.08	5.33
Research Self-Efficacy	261	17.37 to 98.95	71.59	16.12
Interest in Research	261	1.63 to 5.0	3.75	.72
Research Mentoring	261	1.00 to 5.0	2.30	.99

According to the resulted presented in Table 3, the range for post-graduate counseling

experience was 0 years to 25 years. The average number of years of experience was 4.08 ($SD =$

5.33). There were 4 (1.5%) individuals who reported 25 years of experience. The most frequent

experience reported was 0 years (23.7%, $n = 62$). The majority of students had between 0 and 4

years of post-graduate counseling experience (72.0%, $n = 188$). The mean score for research self-

efficacy was 71.59 ($SD = 16.12$, Range: 17.37 to 98.95). A response on the Research Self-

Efficacy Scale that was between 30 and 60 denoted a moderate response, while responses greater

than 60 denoted complete confidence in the response item. The interest in research mean was

3.75 ($SD = .72$; range 1.63 to 5.0). The mean score of 3.75 was an indicator that the participants

had a moderate interest in research. The research mentoring had a mean score of 2.30 ($SD = .99$;

range 1.0 to 5), which implied that the participants had a moderate rating of their perceptions of

their research mentor. The results and findings are discussed next. Included in this section are the

correlation, ANOVA, MLR, and SEM for each research question.

Results and Findings

The data analysis results are reviewed in the next section. The data analysis includes the evaluation of each research question in this study. The statistical procedures that were used in the analysis were for the purpose of determining if there was a statistical relationship among the variables in the study. The Statistical Package for the Social Sciences software (SPSS, 2008) was used to analyze the data in the study. There were multiple statistical procedures utilized to analyze the data. The procedures used for the analysis were Pearson's correlation coefficients (two-tailed), ANOVA, MLR, and SEM. The correlation coefficients allow the researcher to determine if there is a significant statistical relationship between two variables, and in this case, two continuous variables (Gliner & Morgan, 2000). The researcher was interested to know if two or more independent variables had an impact on the dependent variable.

MLR allows the researcher to determine whether or not there is an impact of the two or more independent variables of interest on a dependent variable. It also allows the researcher to control for one of the independent variables (Ary et al., 2010). The purpose of using the ANOVA was to ascertain if there were differences between the independent variables when compared to the dependent variable (research self-efficacy, interest in research, and research mentoring variables; Tabachnick & Fidell, 2007). The researcher was interested as to whether or not the demographic variables (e.g., age, gender, year of doctoral program, and scholarly activity) had affected the variation between research self-efficacy, interest in research, and research mentoring. The researcher was interested in determining if there was a difference between first-, second-, and third-year (or higher) doctoral students with regards to research self-efficacy, interest in research, and research mentoring. Since the differences among groups is of interest,

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using an ANOVA procedure is appropriate because there are more than two groups for comparison and the intent is to test more than one independent variable in the analysis (Lomax, 2007; Gall et al., 2007; Sproull, 1995).

The researcher does not have direct control over the independent variables of interest since they were not manipulated. They still have an effect on the dependent variable. When a difference is noted, a post-hoc test is conducted (Oyster, Hanten, & Llorens, 1987). The post-hoc test that was implemented was the LSD test. The LSD test not only looks at the different categories of the independent variable; it also examines at how the dependent variable is related to the independent variable (Field, 2005). The next section discusses the results for the research Null Hypothesis 1.

Data Analyses and Results for Research Hypotheses/Questions

Research Null Hypothesis 1

Interest in research (as measured by the Interest in Research Questionnaire [IRQ]) and perceptions of research mentoring (as measured by the Research Mentoring Experiences Scale [RMES]) do not predict counselor education doctoral students' reported research self-efficacy (as measured by the Research Self-efficacy Scale [RSES]).

To determine if a statistically significant relationship among research self-efficacy, interest in research, and research mentoring existed, Pearson Correlation coefficients (two-tailed) were calculated. The RMES contains item responses ranging from N/A (Not Applicable) to 5. Since participants were permitted to respond to an item with "N/A," response items with an "N/A" response were shown to be a missing item. Hollingsworth and Fassinger (2002) noted that a participant with no experience with the relative item which would indicate an "N/A" response.

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The items on the scale were analyzed on SPSS using the "analyze missing values" function.

Upon completion of the analysis, seven items were identified that had missing items. The results

of this relationship are presented in Table 4.

Table 4 *Correlation between the Research Self-Efficacy, Interest in Research, and Research Mentoring Scores*

	1	2	3
1. Research Self-Efficacy	--	.372**	-.243**
2. Interest in Research	.372**	--	-.150
3. Research Mentoring	-.243**	-.150	--

Note: ** $p < .01$, $N = 261$

As shown in the results presented in Table 5, there were significant statistical correlations

among the three variables of research self-efficacy, interest in research, and research mentoring.

The strongest correlation was between research self-efficacy and interest in research ($r = .372$, p

$< .01$). The effect size for this relationship was small to moderate ($r^2 = .138$). The correlation

between research self-efficacy and research mentoring was an inverse relationship ($r = -.243$, $p <$

.01), and it had a small effect size ($r^2 = .059$). The correlation between interest in research and

research mentoring was not statistically significant at the .05 level of significance ($r = -.150$, $p =$

.057).

The next analysis for consideration was to determine if there was a significant

relationship among the variables. The statistical method used for this procedure was MLR

analysis where both independent variables were included in the model. The MLR was conducted

for the purpose of appraising the relationship between the independent variables and the

dependent variables in the model. The research self-efficacy scores were treated as the dependent

variable, while the interest in research and research mentoring scores were treated as the independent variables. The results for this multiple regression analysis are presented below in Table 5.

Table 5 *Multiple Regression Results for the Relationships between the Research Self-Efficacy, Interest in Research, and Research Mentoring Scores.*

Parameter	B	Std. Error	t	Sig.	η^2
Intercept	1898.309	270.786	7.010	<.001	.235
Interest in Research	18.237	1.571	11.093	<.001	.121
Research Mentoring	-4.387	.666	-.194	.009	.042

$R^2 = .175$, $N = 261$

As demonstrated by the results presented in Table 6, the interest in research variable did have a statistically significant relationship with the research self-efficacy scores $t(261) = 11.093$, $p < .001$. The research mentoring scores did not have a statistically significant relationship with the research self-efficacy scores $t(261) = -.194$, $p > 001$. Essentially, the model predicted that when there was an increase in one unit of interest in research scores, the research self-efficacy scores increased by 18.24 units. When controlling for research mentoring, a different observation was noticed. Controlling for research mentoring accounted for 5.9% of the variance as opposed to 17.5% when not controlling for research mentoring. The overall model had a small effect size and was able to explain 10% to 30% of the total variance (Cohen, 1988).

While the research mentoring experiences negatively affected research self-efficacy scores, the relationship was still statistically significant ($p < .001$). Since one independent variable (interest in research) had a statistically significant relationship on the dependent variable (research self-efficacy), the null hypothesis was rejected. The null hypothesis stated that there

would be no statistical relationship between the dependent variable and independent variables. The results of the analysis indicated there was a relationship but that there was a small effect size. The results of Research Null Hypothesis 2 are discussed next.

<div align="center">*Research Null Hypothesis 2*</div>

No statistically significant difference exists among counselor education students based on their year of preparation (1st year, 2nd year, and 3rd year and beyond) with respect to their scores in research self-efficacy (as measured by the Research Self-efficacy Scale-Revised [RSES-R],) interest in research (as measured by Interest in Research Questionnaire [IRQ]), and research mentoring (as measured by the Research Mentoring Experiences Scale [RMES]).

Research Null Hypothesis 2 was analyzed using an ANOVA. The research self-efficacy and interest in research scores and research mentoring scores were treated as individual dependent variables. The doctoral counselor education students' year in their preparation programs (i.e., 1st, 2nd, 3rd, and beyond) was treated as the independent variable. The results for the first ANOVA, where research self-efficacy was treated as the dependent variable, is presented in Table 6.

Table 6 *Analysis of Variance Results for Year of Study on Research Self-Efficacy Scores*

Source	SS	*df*	MS	*F*	*p*	η2
Year of Study	6.131E7	7	1459805.857	4.186	<.001	.113
Error	4.791E8	229	338851.493			

R² = .113, *N* = 261

The results presented in Table 7, indicate that the education level of the student did have a significant impact on research self-efficacy scores at the .05 level of significance F (7, 229) = 4.186, $p < .001$ for this data. According to the results, there was a statistically significant

difference between students in their first year of study and students in their second and third year (and higher) when it came to the research self-efficacy scores. The year of study did influence the research self-efficacy scores. The year of study explained 11.3% (.113*100%) of the variation in the research self-efficacy scores. Since the year of program study was shown to be statistically significant, the LSD was conducted to compare the results between the year of study and research self-efficacy. The results of the LSD for year of study and research self-efficacy are presented next in Table 7.

Table 7 *Least Significant Difference Results for Year of Study on Research Self-Efficacy*

(I) Scholarly	(J) Scholarly	Mean Difference (I-J)	SE	p
1	2	207.257	110.768	.063
	3	-516.736*	105.994	<.001
	4	-436.132*	135.950	.002
	5	-450.561*	182.534	.014
	6	-646.907*	306.001	.036
	7	-427.741	350.280	.223
	8	-54.407	595.965	.927
2	3	-309.479*	102.902	.003
	4	-228.874	133.554	.088
	5	-243.304	180.655	.179
	6	-439.650	304.944	.151
	7	-220.483	349.357	.529
	8	152.850	595.423	.798
3	4	80.605	129.621	.535
	5	66.175	177.767	.710
	6	-130.171	303.242	.668
	7	88.995	347.873	.798
	8	462.329	594.553	.438
4	5	-14.430	197.102	.942
	6	-210.776	314.966	.504
	7	8.391	358.139	.981

(I) Scholarly	(J) Scholarly	Mean Difference (I-J)	SE	p
	8	381.724	600.617	.526
5	6	-196.346	337.644	.561
	7	22.821	378.237	.952
	8	396.154	612.814	.519
6	7	219.167	451.019	.627
	8	592.500	660.224	.370
7	8	373.333	671.876	.585

Note: * $p < .05$, $N = 261$

According to the results presented in Table 7, a significant difference was observed between first-year students (23.0%, $n = 60$) and third-year students and beyond (i.e. 3rd year, 4th year, 5th year, etc.,) (46.0%, $n = 120$) on research self-efficacy scores. Students in their first year of their doctoral program scored 512.584 units lower, on average on research self-efficacy scores than third-year students and beyond.

No statistical significant difference was observed between first-year students and seventh-year (1.1%, $n = 3$) or eighth-year students (.4%, $n = 1$) on research self-efficacy scores. A significant statistical difference was found between students in their second year of doctoral study (20.7%, $n = 54$) and their third year students with second-year students scoring 309.479 units lower on research self-efficacy scores than third- years students. This difference was indicated by the negative value located in the *"Mean Difference (I-J)"* column of Table 7. The only statistically significant differences were observed between first- and third-year students and between second- and third-year students. No additional statistical differences were noted for year of study. Since there was only one noted statistical difference for the model in Table 7, Null

hypothesis 3 was rejected. The next statistical analysis used interest in research as the dependent

variable and year in program as the independent variable. The results for this analysis are

presented in Table 8.

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

Source	SS	*df*	MS	*F*	*p*	η2
Education Level	1120.986	7	160.141	1.244	.280	.036
Error	29611.232	230	128.744			

$R^2 = .036, N = 261$

      As shown in the results presented in Table 8, doctoral counselor education students year

in their preparation program did not have a statistically significant impact on the interest in

research scores at the .05 level of significance $F (7, 230) = 1.244$, $p = .280$ for this data. There

was no statistically significant difference between students in their first year of studies and those

in at least their second year (or higher) of schooling when it came to the interest in research

scores. The participants' year of study did not have an influence on the interest in research

scores. The year of study was only able to explain 3.6% (.036*100%) of the variation in interest

in research scores. The results for the interest in research second ANOVA (interest in research

was treated as the dependent variable) are presented in Table 9.

Table 9 *Analysis of Variance Results for Education Level on Research Mentoring Scores*

Source	SS	*df*	MS	*F*	*p*	η2
Education Level	2235.943	6	372.657	.514	.797	.022
Error	100844.447	139	725.500			

$R^2 = .022, N = 261$

As shown in the results presented in Table 9, doctoral counselor education students year in their preparation program did not have a statistically significant impact on the research mentoring scores at the .05 level of significance $F (6, 139) = 1.244$, $p = .797$ for this data. There was no statistically significant difference between students in their first year of studies and those in at least their second year (or higher) of schooling when it came to the interest in research scores. The participants' year of study did not have an influence on the research mentoring scores. The year of study was only able to explain 2.2% (.022*100%) of the variation in interest in research scores. In summary, in all three analyses, doctoral counselor education students' year in their preparation program influenced their research self-efficacy scores but not on interest in research scores and research mentoring. Based on this evidence, the null hypothesis was rejected for year of study influence on research self-efficacy scores (i.e., results were statistically significant) but accepted for the year of study on interest in research and research mentoring scores (i.e., results were not statistically significant). The results of the analysis for research Null hypothesis 3 are discussed next.

Research Null Hypothesis 3

There is no statistically significant difference among scores of research self-efficacy (as measured by The Research Self-efficacy Scale [RSES]), interest in research (as measured by Interest in Research Questionnaire [IRQ]) and research mentoring (as measured by the Research Mentoring Experiences Scale [RMES]) related to counselor education students' demographic variables (age, gender, scholarly activity, specialization, doctoral-level research courses taken, and professional aspirations).

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Research Hypothesis 3 was analyzed using multiple linear regression (MLR). Excluded from the analysis was the demographic variable of location. The location required dummy coding of more than 6 categories which was 26 total. The results for the MLR procedure are presented next in Table 10.

Table 10 *Multiple Regression Results for the Relationships between the Demographic variables and Research Self-Efficacy*

Parameter	Sum of Squares	df.	Mean Square	F	p
Regression	2.112E7	27	78.2298	2.390	<.001
Residual	7.528E7	230	327303.933		
Total	9.640E7	257			

$R^2 = .175, N = 261$

According to the results in Table 10, the MLR results indicated that the effect of the demographic variables on Research Self-Efficacy scores as significant at the .05 level with F (27, 257) = 2.390, $p < .001$ for the model. Since the relationship in the model was shown to be significant, a follow-up ANOVA was run on each set of data. Three ANOVA analyses were conducted to address the third research null hypothesis. The variables of research self-efficacy, was handled as the dependent variables. The demographic variables in the analysis were treated as the independent variables. The scholarly activity was computed as the combined variable of publications and presentations. The results for the first ANOVA where research self-efficacy was treated as the dependent variable are presented in Table 11.

Table 11 *Analysis of Variance Results for Gender, Age, Scholarly Activity, and Years of Experience on Research Self-Efficacy Scores*

Source	SS	df	MS	F	p	η2
Gender	268843.278	1	268843.278	.878	.353	.017
Age	1.76E7	38	388546 .50 1	1.269	.212	.486
Scholarly Activity	2013675.639	1	2013675.639	6.579	.013	.114
Experience	5603796.692	24	233491.529	.763	.762	.264
Error	1.561E7	51	313842.231			

$R^2 = .838$, $N = 261$

According to the results presented in Table 11, the gender of the students did not have a statistically significant impact on the research self-efficacy scores at the .05 level of significance $F(1, 51) = .878$, $p = .353$ for the participants in the study. There was no statistical difference in research self-efficacy scores between males and females. The age of the students was not found to have a statistically significant effect on the research self-efficacy scores, $F(38, 51) = 1.269$, $p = .212$, for the participants, which indicates that age did not have a statistically significant effect on research self-efficacy scores. The post-graduate counseling years of experience did not have a significant effect on the research self-efficacy scores, $F(24, 51) = .763$, $p = .762$ for the participants in the study. The amount of scholarly activity the participants reported was statistically significant, $F(1, 51) = 6.579$, $p = .013$ for the data. The scholarly activity variable was able to explain 11.4% 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 R^2 value is the amount of variability that one variable has on another. It is related to eta square (Field, 2005). The model presented in Table 9 was able to explain 83.8% (.838*100%) of the variation in the research self-efficacy scores. Since the scholarly activity of the student was found to be statistically significant, the

LSD procedure was used to determine how those who had scholarly activity compared to those

who did not on Research Self-Efficacy scores (Table 12).

Table 12 *Least Significant Difference Results for Scholarly Activity*

(I) Scholarly	(J) Scholarly	Mean Difference (I-J)	SE	p
No	Yes	-362.067*	78.047	<.001

Note: * $p < .05$, $N = 261$

According to the results presented in Table 12, it was found that students with no

scholarly experience ($n = 79$, 30.3%) scored lower than students with scholarly activity ($n = 180$,

69.0%) in terms of research self-efficacy scores for the participants in the study. It was found

that students who had not engaged in scholarly activity (no publications or presentations) scored

362.067 units lower on the total research self-efficacy scores (9.53 unit different when total score

is divided by number of items [38]) when compared to students who had engaged in scholarly

activity. This difference was indicated by the negative value located in the *"Mean Difference (I-*

J)" column of Table 12. Since there was one noted statistical difference noted for the model in

Table 12, null hypothesis 3 was rejected. The ANOVA results for the relationship the

demographic variables of race/ethnicity, number of research courses taken, professional

aspirations and research self-efficacy scores are presented next in Table 13.

Table 13*ANOVA Results for Race/Ethnicity, Number of Research Course Taken, Professional Aspirations, and Research Self-Efficacy Scores*

Source	SS	*df*	MS	*F*	*p*	η2
Race/ethnicity	380543.717	6	63423.953	.199	.977	.007
CES Specialization	1169570.690	4	292392.673	.918	.455	.021
Research Courses Completed	5624806.597	2	2812403.298	8.827	<.001	.095
Professional Aspirations	1617719.068	3	539239.682	1.692	.171	.029
Error	5.3533E7	168	318625.919			

R² = .449, N = 261

Based on the results presented in Table 13, the variable of race/ethnicity did not have a statistically significant impact on the perceptions of the research training environment scores at the .05 level of significance $F (6, 168) = .199$, $p = .977$ for this data. Therefore, there was no significant difference observed between the race/ethnicity of the participants for research self-efficacy scores. No significant difference was observed for CES area of specialization at the .05 level of significance $F (4,168) = .918$. $p = .455$. There was no observed significant statistical difference for career aspirations and the research self-efficacy scores $F (3,168) = 1.692$, $p = .171$. As for the number of research courses taken, it was found that there was a significant difference between the research self-efficacy scores and the number of research courses taken. The overall model was able to explain 44.9% (.449*100%) of the variation in the research mentoring scores. Since the number of research courses was statistically significant on research self-efficacy, the LSD procedure was used to determine the difference between those with scholarly activity and those with none. The results are presented in Table 14.

Table 14 *Least Significant Difference Results for Research Courses Taken Comparison*

(I) Course	(J) Course	Mean Difference (I-J)	SE	p
0 to 2	3 to 4	-426.5153*	85.35749	<.001
	Over 5	-581.6879*	90.69557	<.001
3 to 4	0 to 2	426.5153*	85.35749	<.001
	Over 5	-155.1725	84.41975	.068
Over 5	0 to 2	581.6879*	90.69557	<.001
	3 to 4	155.1725	84.41975	.068

Note: $* p < .05$, $N = 259$

Based on the results presented in Table 14, it was found on average that students who had taken between 0 - 2 doctoral research course ($n = 76$) scored lower on research self-efficacy than students who had taken either 3-4 research courses ($n = 104$) or 5 or more research courses ($n = 79$). The students who had taken 0-2 research courses on research self-efficacy scores scored 426.52 units lower than students who completed 3 - 4 doctoral research courses and 581.69 units lower than those who had complete 5 or more. No statistical significance was noted on research self-efficacy scores between students who completed 3 - 4 doctoral courses and students who had completed 5 or more doctoral courses.

The results of the analysis using research self-efficacy as the dependent variable and variables of Rating of Research Methodology Competency (RMC), Rating of Interest in Research Methodology (IRM), Rating of Research Mentor (RM) are presented in Table 15.

Table 15 *Analysis of Variance Results for Rating of Research Methodology Competency (RMC), Rating of Interest in Research Methodology (IRM), and Rating of Research Mentor (RM) and Location on Research Self-Efficacy Scores*

Source	SS	*df*	MS	*F*	*p*	η2
Rating RMC	76284401.196	3	2542800.399	17.447	<.001	.421
Rating IRM	215240.828	3	71746.943	.492	.689	.020
Rating RM	1734897.502	4	433724.376	2.976	.025	.142
Error	1.049E7	72	145740.554			

R² = .892, *N* = 261

Based on the results presented in Table 16, there was no statistically significant relationship between the dependent variable of interest in research and the Rating IRM. The IRM of the student did not have a statistically significant impact on the research self-efficacy scores at the .05 level of significance $F_{(3, 72)} = .492$, $p = .689$ for the participants in the study. The variable of location did not have a statistically significant impact on the research self-efficacy scores at the .05 level of significance $F_{(27, 72)} = 1.393$, $p = .134$. The variable of RM was found to have a statistically significant effect on research self-efficacy scores, $F_{(4, 27)} = 2.976$, $p = .025$. The RMC of the participants did have a statistically significant impact on research self-efficacy scores, $F_{(3, 219)} = 17.447$, $p < .001$ for the data. The model presented in Table 18 was able to explain 89.2% (.892*100%) of the variation in the interest in research scores. Since the variable RMC was significant, the LSD procedure was used to determine the difference between the self-rating of research competency on Research Self-Efficacy Scores. The results are presented in Table 16.

Table 16 *Least Significant Difference Results for Research Methodology Competency (RMC)*

(I) Rating	(J) Rating	Mean Difference (I-J)	SE	p
1	2	-151.705	108.082	.165
	3	-804.599*	107.497	<.001
	4	-1.192E3*	139.043	<.001
2	3	-652.854*	56.220	<.001
	4	-1.040E3*	104.585	<.001
3	4	-387.227*	1033.981	<.001

Note: * $p < .05$, $N = 261$

Based on the results presented in Table 16, statistically significant relationships were found between ratings of 1 and 3, 1 and 4, 2 and 3, 2 and 4, and 3 and 4. No statistically significant relationship was observed for a RMC rating of 1 and 2. It was found on average that students who had rated themselves a 1 ($n = 15$) scored lower than those who rated themselves as either a 3 on research competency ($n = 127$) or those students who rated themselves a 4 ($n = 17$) (804.599 units and 1192 units respectively). The students who had rated themselves a 2 ($n = 99$) scored lower on research self-efficacy scores than those who rated themselves as either a 3 or a of 4 (690.246 units and 1002 units respectively). The students who rated themselves a 3 scored 387.23 units lower than those who rated themselves a 4 on Research self-efficacy. Since the Rating of the Research Mentor (RM) was also significant, LSD was conducted. There was one response with a rating of 5. Since there was only response on research mentoring with a rating of 5, this was eliminated from the comparisons since there were fewer than two cases in the group. The results for the LSD are presented in Table 17.

Table 17 *Least Significant Difference Results for Rating Research Mentor (RM)*

(I) Rating	(J) Rating	Mean Difference (I-J)	SE	p
1	2	-141.573	93.130	.133
	3	-281.515*	85.176	.001
1	4	-235.950*	85.504	.007
2	3	-423.089*	74.697	<.001
	4	-377.523*	73.930	<.001
3	4	45.523	63.620	.476

Note: * $p < .05$, $N = 261$

Based on the results presented in Table 17, a statistically significant relationship was found between ratings of 1 and 3, 1 and 4, 2 and 3, and 2 and 4 of research mentoring on research self-efficacy scores. No significant relationship was observed for a rating of 1 and 2 and the rating of 1 and 4. It was found on average that students who had rated themselves a 1 ($n = 30$) scored lower than those who rated themselves as either a 3 ($n = 81$) or a 4 ($n = 97$; 281.515 units and 235.950 units respectively). The students who had rated themselves a 2 ($n = 49$) scored lower on research self-efficacy scores than those who rated themselves as either a 3 or a 4 (423.089 units and 377.523 units respectively). There was no statistically significant relationship observed between students who rated themselves a 3 and those who rated themselves a 4 on Research Self-Efficacy.

The final analysis involves the analysis of the remaining independent variables (having a research mentor prior to doctoral studies [PRM], whether the students were in a cohort model [CM] whether the students were involved as an investigator of quantitative study [QI], or qualitative study [QLI], type of doctoral degree program) on the dependent variables of research

self-efficacy, interest in research and research mentoring. The first analysis using the dependent

variable of research self-efficacy is presented in Table 18.

Table 18 *Analysis of Variance Results for research mentor prior to doctoral studies (PRM), cohort model, investigator(y/n) quantitative (QI), investigator, (y/n) qualitative (QLI), type of doctoral degree program on Research Self-efficacy Scores.*

Source	SS	df	MS	F	p	η2
PRM	14963118.886	1	14963118.886	4.633	.032	.020
Cohort	989.961	1	989.961	.003	.956	<.001
QI	2752820.445	1	2752820.445	8.523	.004	.036
QLI	675763.040	1	675763.040	2.092	.149	.009
Degree Track	385.041	1	385.041	.001	.972	<.001
Error	7.461E7	213	322973.689			

$R^2 = .232, N = 261$

Based on the results presented in Table 18, there was no statistically significant

relationship between the dependent variable of research self-efficacy and the independent

variables of Cohort, QLI, and Degree type. The cohort of the student did not have a statistically

significant impact on the research self-efficacy scores at the .05 level of significance F (1,213) =

.003, p = .956, for the participants in the study. The variable of QLI was found to have no

statistically significant effect on research self-efficacy scores, F (1, 213) = 2.092, p = .149 for the

data. The variable of Degree Type was also found to have no statistically significant effect on

research mentoring scores, F (1, 213) = .001, p = .972. The PRM of the student did have a

statistically significant effect on research self-efficacy scores at the .05 level of significance F (1,

213) = 4.633, p = .032 for the data. The variable of QI was found to have no statistically

significant effect on research self-efficacy scores, F (1, 213) = 8.523, p = .004 for the data. The

model presented in Table 18 was able to explain 23.2% (.232*100%) of the variation in the

interest in research scores. Since the variable PRM and QI had a significant effect on research

self-efficacy scores, the LSD procedure was used to determine the difference between PRM and

QI on Research Self-Efficacy Scores. The results are presented in Table 19 for PRM and Table

280for QI. Table 19 results are presented next.

Table 19 *Least Significant Difference of Having a Prior Research Mentor (PRM)*

(I) Rating	(J) Rating	Mean Difference (I-J)	SE	p
yes	no	-287.358*	116.273	.014

Note: * $p < .05$, $N = 261$

   Based on the results presented in Table 19, statistical significance exists for the LSD on

PRM between the students who had a prior research mentor ($n = 172$) and those who did not

have a prior research mentor ($n = 86$). The students who had a prior research mentor actually

scored 287.4 units lower on research self-efficacy than those who did not have a research

mentor. The LSD for the differences between the QI variable and research self-efficacy is

presented in Table 20.

Table 20 *Least Significant Difference of Quantitative Investigator (QI)*

(I) Rating	(J) Rating	Mean Difference (I-J)	SE	p
yes	no	479.153*	119.187	< .001

Note: * $p < .05$, $N = 261$

   Based on the results presented in Table 20, statistical significance difference was

identified between the students who had were an investigator in a quantitative research project

(QI)1 ($n = 117$) and those who did had not been an investigator in a quantitative research project

($n = 141$). The students who had been involved as an investigator in a quantitative research

project scored 479.15 units higher on research self-efficacy than those who did not have a

research mentor. Based on the model presented in Table 20, the null hypothesis 3 is rejected for

the model since at least one of the variables showed a statistically significant relationship. The

results for the MLR procedure for the relations between the demographic variables and Interest

in Research is presented next in Table 21.

Table 21 *Multiple Regression Results for the Relationships between the Demographic variables and Interest in Research*

Parameter	Sum of Squares	df.	Mean Square	F	p
Regression	6991.556	27	258.947	2.187	.001
Residual	27.353	231	118.411		
Total	34344.575	258			

$R^2 = .204$, $N = 261$

According to the results in Table 21, the MLR results indicated that the effect of the

demographic variables on Interest in Research scores was significant at the .05 level with F (27,

258) = 2.390, $p = .001$ for the model. Since the relationship in the model was shown to be

significant, a follow-up ANOVA was run on each set of data. ANOVA analyses were conducted

on the demographic variables as the independent variables and interest in research as the

dependent variable. The results for the first ANOVA where interest in research was treated as the

dependent variable and the independent variables (e.g. gender, age, scholarly activity and years

of experience) are presented next in Table 22.

The next statistical analysis used interest in research as the dependent variable and the

variables of gender, age, scholarly activity, and counseling experience as the independent

variables. The results for this analysis are presented in Table 22.

Table 22 *Analysis of Variance Results for Gender, Age, Scholarly Activity, and Years of Experience on Interest in Research Scores*

Source	SS	*df*	MS	*F*	*p*	η2
Gender	87.309	1	87.309	.790	.378	.015
Age	5338.091	38	140.476	1.270	.211	.486
Scholarly Activity	819.411	1	819.411	7.410	.009	.127
Experience	3807.618	24	158.632	1.435	.139	.403
Error	5639.5	51	110.578			

$R^2 = .834$, $N = 261$

According to the results presented in Table 22, the gender of the students did not have a statistically significant impact on the Interest in Research scores at the .05 level of significance $F (1, 51) = .790$, $p = .378$, for the participants in the study. No statistical difference in interest in research scores between males and females was observed. The age of the students was found to have no statistically significant effect on interest in research scores, $F (38, 51) = 1.270$, $p = .211$. The post-graduate counseling years of experience did not have a significant effect on the interest in research scores, $F (24, 51) = 1.435$, $p = .139$, for the participants in the study. The amount of scholarly activity the participants reported was statistically significant, $F (1, 51) = 7.410$, $p = .009$ for the data. The scholarly activity variable was able to explain 12.7% 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 R^2 value is the amount of variability that one variable has on another, relating to eta square (Field, 2005). The model using presented in Table 11 was able to explain 83.4% (.834*100%) of the variation in the interest in research scores. Since the scholarly activity of the student was found to be statistically significant, the LSD procedure was used to determine the difference between those with scholarly activity and those with none. The results of the LSD are presented next in Table 23.

Table 23 *Least Significant Difference Results for Scholarly Activity Comparison*

(I) Scholarly	(J) Scholarly	Mean Difference (I-J)	SE	p
No	Yes	-3.544*	1.482	.021

Note: * $p < .05$, $N = 261$

  According to the results presented in Table 23, it was found that students with no scholarly experience ($n = 79$, 30.3%) scored lower than students with scholarly activity ($n = 180$, 69.0%) in terms of Interest in Research scores. It was found that students who had not engaged in scholarly activity (no publications and presentations) scored 3.544 units lower on the total Interest in Research scores when compared to students who had engaged in scholarly activity. Since model presented in Table 22 had at least one statistically significance (interest in research and scholarly activity), the null hypothesis was also rejected for this model. The next statistical analysis used research mentoring as the dependent variable and the variables of gender, age, scholarly activity, and counseling experience as the independent variables. The results of the statistical analysis using interest in research as the dependent variable and the variables of race/ethnicity, CES specialization, number research courses taken, and professional aspirations are presented in Table 24.

Table 24 *ANOVA Results for Race/Ethnicity, Number of Research Course Taken, Professional Aspirations, and Interest in Research Scores*

Source	SS	*df*	MS	*F*	*p*	η2
Race/ethnicity	447.832	6	74.639	.650	.690	.023
CES Specialization	1033.017	4	258.254	2.249	.066	.051
No Research Courses taken	43.152	2	21.576	.188	.829	.002
Professional Aspirations	500.401	3	166.800	1.453	.229	.025
Error	19291.373	168	114.830			

$R^2 = .435$, $N = 261$

Based on the results presented in Table 24, there was no statistically significant relationship between the dependent variable of interest in research and the independent variables of race/ethnicity, CES area of specialization, number of research courses taken, and professional aspirations. The race/ethnicity of the student did not have a statistically significant impact on the Interest in Research scores at the .05 level of significance $F (6, 168) = .650$, $p = .690$ for the participants in the study. The variable of CES specialization was found to have no statistically significant effect on interest in research scores, $F (4, 168) = 2.249$, $p = .066$. The number of doctoral research courses was found to have no statistical significant effect on interest in research scores, $F (2, 168) = .188$, $p = .829$. The professional aspirations of the participants did not have a statistically significant impact on interest in research, $F (3, 128) = 1.453$, $p = .229$ for the data. The model presented in Table 24 was able to explain 43.5% (.435*100%) of the variation in the interest in research scores. Since there was no statistical significance noted for the model in Table 24, the null hypothesis is accepted for this analysis.

The results of the analysis using interest in research as the dependent variable and variables of Rating of Research Methodology Competency (RMC), Rating of Interest in Research Methodology (IRM), Rating of Research Mentor (RM) are presented in Table 25.

Table 25 Analysis of Variance Results for Rating of Research Methodology Competency (RMC), Rating of Interest in Research Methodology (IRM), and Rating of Research Mentor (RM) and Location on Interest in Research Scores

Source	SS	df	MS	F	p	η2
Rating RMC	720.606	3	240.202	3.696	.016	.133
Rating IRM	3277.763	3	1092.588	16 .814	< .001	.412
Rating RM	365.861	4	91.465	1.408	.240	.073
Error	4678.740	72	64.983			

$R^2 = .863$, $N = 261$

Based on the results presented in Table 25, there was no statistically significant relationship between the dependent variable of interest in research and the independent variables of Rating RM and location. The RM of the student did not have a statistically significant impact on the interest in research scores at the .05 level of significance $F (4, 72) = 1.408$, $p = .240$ for the participants in the study. The RMC of the participants did have a significant impact on interest in research, $F (3, 72) = 3.696$, $p = .016$. The IRM of the participants did have a significant impact on interest in research, $F (3, 72) = 16.814$, $p < .001$ for the data. The model presented in Table 25was able to explain 86.3% (.863*100%) of the variation in the interest in research scores. Since the variables of RMC and IRM were statistically significant, the Least Significant Difference (LSD) procedure was used to determine the difference between the self-rating of research competency and rating of interest in research methodology. The results are presented in Table 26 for the LSD of RMC.

Table 26 Least Significant Difference Research Methodology Competency (RMC)

(I) Rating	(J) Rating	Mean Difference (I-J)	SE	p
1	2	6.246*	2.282	.008
	3	2.419	2.268	.290
	4	-6.929*	2.936	.021
2	3	-3.827*	1.184	.002
	4	-13.174*	2.208	< .001
3	4	-9.347*	2.194	< .001

Note: * $p < .05$, $N = 261$

Based on the results presented in Table 26, there were statistically significant relationships observed between participants who rated themselves a 1 ($n = 3$) and those who rated themselves a 2 ($n = 53$), with participants rating themselves a 1 on RMC scoring 6.25 units higher on interest in research than those rating themselves a 2 on interest in research scores. The participants rating themselves a 1 scored 6.93 units lower than those who rated themselves a 4 ($n=99$). A statistically significant difference was noted for students who rated themselves a 2 and those who rated themselves as either a 3 ($n=104$) or a 4 (3.827 units and 13.174 units respectively). A statistically significant difference was also noted for those students who rated themselves a 3 compared to those who rated themselves a 4 (9.347 unit difference). The IRM was also observed to have a statistically significant effect on the interest in research scores. The results of the LSD with the IRM are presented in Table 27.

Table 27 Least Significant Difference Interest in Research Methodology (IRM)

(I) Rating	(J) Rating	Mean Difference (I-J)	SE	p
1	2	-21.096*	4.793	< .000
	3	-29.845*	4.737	< .000
	4	-40.494*	4.740	< .000
2	3	-8.749*	1.447	< .000
	4	-19.398*	1.459	< .000
3	4	-10.649*	1.261	< .000

Note: * $p < .05$, $N = 261$

Based on the results presented in Table 27, there were statistically significant relationships observed between participants on every rating of IRM. Participants who rated themselves a 1 ($n = 3$) scored 21.096 points lower than those who rated themselves a 2 ($n = 53$) on interest in research. Participants rating themselves a 1 on IRM scored lower on interest in research than those who rated themselves as either a 3 ($n=104$) or a 4 ($n=99$) (29.85 units and 40.49 units respectively). Participants rating themselves a 2 on the IRM variable scored lower than those rating themselves as either a 3 or a 4 (8.8 units and 19.4 units respectively) on interest in research scores. A statistically significant difference was also noted for those students who rated themselves a 3 compared to those who rated themselves a 4 (10.679 unit difference). Since there was a statistical significance noted for the model in Table 27, the null hypothesis is rejected for this analysis. The results of the MLR for the relationship between the demographic variables and Research Mentoring Experiences is presented next in Table 28.

Table 28 *Multiple Regression Results for the Relationships between the Demographic variables and Research Mentoring Experience*

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Parameter	Sum of Squares	df.	Mean Square	F	p
Regression	18000.843	27	666.698	.915	.589
Residual	7.528E7	230	327303.933		
Total	9.640E7	257			

_____

$R^2 = .175$, $N = 261$

According to the results in Table 28, the MLR results indicated that the effect of the demographic variables on Research Mentoring scores were not significant at the .05 level with F (27, 257) = .915, p = .589 for the model. Since the relationship in the model was shown to not be significant, no follow-up ANOVA procedures were was run on the data. The results of Research hypothesis four are discussed next.

Research Question 4

Is the relationship observed of the effect of research mentoring (as measured by the *Research Mentoring Experiences Scale*) on research self-efficacy (as measured by the *Research Self-efficacy Scale*) improved using structural equation modeling due to its correction for measurement error in the instruments?

The three constructs of interest (i.e. research self-efficacy, interest in research and research mentoring) where ran in structural equation modeling using Statistical Analysis System (SAS) to evaluate the relationship between the constructs for latent variables. The specific relationship of interest was the effect of research mentoring on research self-efficacy. After running the analysis, the results were not parsimonious to recommend continuation of the use of SAS. The relationship observed between research mentoring and research self-efficacy run on

SAS ($r = -.264$, $p < .01$) was not observed to be an improvement from the relationship observed from the regression analysis between research self-efficacy and research mentoring ($r = -.243$, $p < .01$). Therefore, the model was not continued further with structural equation modeling (SEM). SEM allows for a researcher to confirm relationships run under traditional regression analysis (Raynov, & Marcoulides, 2006). This is not surprising because the reliabilities of the measures were very high to start with (exceeding .90). According to Sivo, Pan, and Hahs-Vaughn, (2007), additional analysis using SEM would be warranted if the results of the analysis indicated a different coefficient and direction (i.e. positive or negative) of the relationship (i.e. the relationship between the effect of one variable on the other is reversed and the sign is different).

Summary

The ANOVA analyses for this study are summarized in Table 34. Regarding research hypothesis one, all three variables were found to have statistically significant relationships. The strongest of the three correlations was with research self-efficacy and interest in research. Research self-efficacy and research mentoring had an inverse relationship. As research mentoring scores increased, the research self-efficacy scores decreased. Running the analysis as a MLR yielded similar results. The relationships were statistically significant with the strongest relationship existing between research self-efficacy and interest in research and an inverse relationship (negative correlation) between research self-efficacy and research mentoring.

Concerning research hypothesis two, the results indicated that there was a statistically significant difference between the students in their first year, second semester; second year; and third year (and higher) when it came to research self-efficacy scores. It was found that there was no statistically significant relationship between year in program and interest in research and

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research mentoring scores. The results of the third research hypothesis indicated that when research self-efficacy scores were treated as the dependent variable in the ANOVA analysis against the demographic variables (e.g., gender, age scholarly activity, and counseling experience), scholarly activity of the student was the only demographic variable where a statistical significance was observed. Regarding this observation, students with no scholarly activity experience ($n = 79$, 30.3%) scored lower than students with scholarly activity ($n = 180$, 69.0%) with regards to overall score of the research self-efficacy scale. Since one variable had a significant statistical relationship in the model, the results argued against the null hypothesis. When the analysis was run using interest in research as the dependent variable, scholarly activity was the lone demographic variable with a statistically significant effect on interest in research. Students with no scholarly activity scored lower on the interest in research scores than the students with scholarly activity. Since one demographic variable in the model using interest in research was statistically significant, the null hypothesis was rejected. When research mentoring was used as the dependent variable with the demographic variables, no statistical significance was observed, so the null hypothesis was accepted.

When the analysis was run with research self-efficacy and the remaining demographic variables (race/ethnicity, age, number of doctoral graduate courses taken, and professional aspirations), the number of doctoral graduate courses taken was the only variable where a statistical significance was observed. Student who had completed between 0 - 2 doctoral research courses scored lower than students who had completed between 3 - 4 and 5 or more. There was no statistical significance observed for research self-efficacy scores for students who had completed 3 - 4 courses and those who had completed 5 or more. Since one variable was shown

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to have a statistically significant effect on research self-efficacy, the null hypothesis was rejected. When Interest in Research scores and Research mentoring scores were used as the dependent variables, none of the independent variables (race/ethnicity, age, number of doctoral graduate courses taken, and professional aspirations) were shown to have a statistically significant effect on the dependent variables. The null hypothesis on both the interest in research and research mentoring using these variables (race/ethnicity, age, number of doctoral graduate courses taken, and professional aspirations) was accepted. The summary of results and findings of the statistical procedures (including structural equation modeling) is presented next in Table 29.

Table 29 *Summary of Results and Findings for Research Questions*

Research Question	Findings
One (a): Correlation between research self-efficacy, interest in research scores and research mentoring scores	• Interest in research was positively correlated with research self-efficacy ($r = .372$, $p < .001$) • Interest in research was not correlated with research mentoring ($r = -.150$, $p = .057$).
One (b): Multiple regression between research self-efficacy, interest in research, and research mentoring scores	• Interest in research was positively correlated after controlling for research mentoring ($p < .001$, $\eta2 = .156$; 15.6%) • Research Mentoring was correlated with research self-efficacy, after controlling for the interest in research scores ($p = .009$, $\eta2 =$

Research Question	Findings
	.042; 4.2%)
Two (a): Year of Preparation inProgram had an effect on research efficacy scores	• Year of Preparation in Program influenced research self-efficacy scores ($p < .001$, $\eta2 = .113$; 11.3%)
Two (b): Education Level had an effect on the interest in research scores	• Education level did not have a statistically significant effect on the interest in research scores ($p = .280$, $\eta2 = .036$; 3.6%)
Two (b): Education Level had an effect on Research Mentoring Scores	• Education level did not have a statistically significant effect on Research Mentoring Scores ($p = .797$, $\eta2 = .022$; 2.2%)
Three (a): Multiple regression between the demographic variables on the research self-efficacy scores	• The demographic variables were correlated with Research Self-Efficacy Scores $F (27, 257) = 2.390$, $p < .001$
Three (b) The ANOVA procedure, with gender age, years counseling experience and scholarly activity had a significant relationship with Research Self-Efficacy scores	• Gender did have a statistically significant effect on the research self-efficacy scores ($p < .001$, $\eta2 = .017$; 1.7%) • Age did not have a statistically significant effect on the research self-efficacy scores ($p= .212$, $\eta2 = .486$; 4.9%)

Research Question	Findings
Three (b) The ANOVA procedure with gender, age, years counseling experience and scholarly activity had a significant relationship with Research Self-Efficacy scores	• Years counseling experience did not have a statistically significant effect on the Research Self-Efficacy scores ($p= .762$, $\eta2 = .264$; 2.6%) • Scholarly Activity did have a statistically significant effect on the research self-efficacy scores ($p .013$, $\eta2 = .114$; 11.4%)
Three (c): Multiple regression between the demographic variables on the Interest in Research scores	• The demographic variables were correlated with Research Self-Efficacy Scores $F (27, 258) = 2.187$, $p = .001$
Three (d): Gender, Age, Scholarly, and years counseling experience Activity had an effect on the interest in research scores	• Gender did not have a statistically significant effect on the interest in research scores ($p = .378$, $\eta2 = .015$; 1.5%) • Age did not have a statistically significant effect on the interest in research scores ($p = .211$, $\eta2 = .486$; 48.6%) • Years counseling experience did not have a statistically significant effect on the research self-efficacy scores ($p= .139$, $\eta2 = .403$; 40.3%)

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Research Question	Findings
	• Scholarly Activity did have a statistically significant effect on the interest in research scores ($p = .009$, $\eta2 = .127$; 12.7%)
Three (e): Multiple regression between the demographic variables on the Research Mentoring scores	• The demographic variables were not correlated with Research Self-Efficacy Scores $F (27, 161) = .915$, $p = .589$
Four (a) Structural Equation Modeling will improve the relationship between Research Mentoring and Research Self-Efficacy when accounting for measurement error	Structural Equation Modeling did not improve the relationship between RSES and RMES when accounting for measurement error

CHAPTER FIVE: DISCUSSION

The purpose of this study was to examine the relationship between the constructs of research self-efficacy, interest in research, and research mentoring in a national sample of counselor education doctoral students. In addition, the investigation examined the relationship between the three research constructs and the reported demographic variables of counselor education doctoral students: 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 eight 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 scientist-practitioner model is the standard of research models for education and social sciences (Aspenson & Gersh, 1993; Benjamin Jr., & Baker, 2000; Baker, & Benjamin, Jr., 2000). While the Boulder model (scientist-practitioner model) is intended to develop a professional who is skilled at both research and practice, the actual administration of the model is difficult for academic programs as it is challenging for preparation programs to both comprehensive research and practice training opportunities (Horn, et. al, 2007; Sexton, 2000). According to Sexton (2000), a restructuring of counseling programs needs to be done since there has been a shift in the field of counseling to more evidenced-based practice.

The research examining research competency in the field of counselor education is limited. Studies involving the examination of the construct of research activity of doctoral students in counselor education is also limited (Briggs & Pehrsson, 2008; Protivnak & Foss, 2009; Reisetter et al. 2004). Counselor education programs have not develop their students' identify as researcher and many graduates of doctoral counselor education programs do not possess sound research competencies (skills and dispositions; e.g., Altekruse, 1991; Maples & Altekruse, 1993; Lambie, et. al, 2008; Rawls, 2008; Reisetter, et al., 2004). Research and practice go together, especially when the emphasis on practice is evidenced-based. An integration of research and practice competencies should occur at the professional and training level (Erwin, 2001; Granello & Granello, 1998; Niles, Akos, & Cutler, 2001).

Research is essential for the allowing the field of counselor education to grow (Belar, 1998; Belar, 2000). Conducting research has value, not just for the individual researcher for tenure and promotion (Okech et al., 2003), but for the university as well in order to be supported for funding for further research (McGrail, Rickard, & Jones, 2006). Since there is limited research examining the constructs focusing on the growth of doctoral students as researchers (e.g. Miller, 2006; Lambie & Vaccaro, 2011), additional investigation examining doctoral student research constructs in counselor education are warranted.

The study utilized an ex-post factor, cross-sectional, correlational design to analyze the objective of the study. The objective of the study was to establish if there was a significant relationship between research self-efficacy, interest in research, and research mentoring in a national sample of doctoral counselor education students. Additionally, it was theorized by the researcher that there were other factors connected to the relationship between research self-

efficacy and research mentoring that could not be explained by a correlation analysis. The doctoral students involved in the study were from a national sample of students in Council for Accreditation of Counseling and Related Educational Programs (CACREP) programs. The examination between the three constructs of research self-efficacy (dependent variable) and interest in research and research mentoring (co-independent variables) was conducted. The three constructs of interest were measured with interval data. The study also used the demographic variables reported by the doctoral student participants (i.e., age, gender, scholarly activity, specialization, doctoral-level research courses taken, and professional aspirations). Next, a review of the sample as compared to samples in previous similar research is presented.

A mixed approach was employed to the administration of the three data collection instruments. There were a total of 59 CACREP counselor education doctoral programs identified nationally. Each program was contacted of which, 24 agreed to participate in the study (program response rate 40.7%). Two of the programs who agreed to participate in the study requested mailed survey packets. A total of 90 packets were sent to the respective students with a return of 18 (20% response rate). The electronic survey responses totaled 347 of which, 104 were removed for analysis for being incomplete or not meeting the study criteria. The response rates in similar studies were 63.1% ($N = 89$) by Lambie and Vaccaro (2011); 29.3% ($N = 255$) by Geisler, (1995); and 39.7% ($N = 167$) Okech et al., (2006). Kahn and Schlosser (2010) had a program response rate of 35% ($N = 120$) for the programs they invited to participate in their study. The next section summarizes the sample demographics.

Sample Demographics

Gender

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The participants in the study had the following demographic makeup: female (75.5%, $n =$ 197), male (23.8%, $n = 62$) and other/not specified gender (.8%, $n = 2$). Having gender representation that is more than 50% female was similar to other studies involving doctoral students in counseling and counseling psychology where it is common for more females to be in these programs than males. For example, Lambie and Vaccaro (2011) had 89 counselor education doctoral students with 59 females (66.3%), 29 males (32.6%) and 1 other gender (1.1%). Miller (2006) had a sample of 103 counselor education students of which, 68 were female (66%) and 35 were male (34%). Bishop and Bieschke's (1998) study included a total sample of 184 with 127 females (69%) and 57 men (31%). Kahn (2001) surveyed 149 doctoral students with 112 (75.2%) females and 37 men (24.8%). Based on the similar studies, there are more females in doctoral counselor education and related programs (i.e. counseling psychology, psychology) than there are males. The demographic variable of age is discussed in the next section.

Age

The age group in this study with the highest number of participants was 31 to 40 years of age (41.3%, $n = 36$). The next highest age group in the study was 23 - 30 years of age (31.1%, n = 31.1%). The age group of 41 years and greater was represented by 26% ($n = 68$). In review of the literature, the results for the age group of 31 to 40 and 23 - 30 was the complete reversal of Lambie and Vaccaro (2011) had surveyed 89 doctoral students in counselor education and had the age majority of the participants be in the 21 - 30 years of age group (40.4%, $n = 36$) followed by the 31 to 40 years of age (38.2%; $n = 34$). Rawls (2008) surveyed 245 participants in counselor education and found that 38.4% of the participants were between 30 - 37 years of age

which was followed by 22 - 29 years of age (18.8%) and 38 - 45 years old (19.6%). Aside from slight differences from comparable studies, the age group represented in this study was similar with the largest number of participants being in the 31 to 40 years of age range. The demographic of year of study in counselor education is discussed next.

Year of Study Counselor Education Doctoral Program

The year of doctoral study reported by the participants in the study was predominantly third year or greater 47.5% ($n = 124$). The first year students consisted of 20.7% ($n = 54$), and the second year comprised of 23.0% ($n = 60$). There were a total of 23 participants (8.8%) who did not provide a year of study. Comparing the demographic of year of study to similar research, Black (1998) surveyed 229 doctoral students in counselor education with 59.0% in their first or second year of their doctoral program, 21.5% were in their third year of study and the remaining participants were in the fourth year or beyond in their respective studies. Miller (2006) had a sample of 103 participants and their reported of time in program was by semester not year in program. In Miller's study, the average time completed in the program was 2.22 semesters. Hollingsworth and Fassinger, (2002) surveyed 194 doctoral students in APA approved counseling psychology programs with 95% of the participants reporting that they were in their third or fourth year of study. The majority of participants were in their third year or higher. The demographic results in the present study slightly contract comparable studies were the participants were mostly comprised of their first and second year of study. The demographic characteristic of ethnicity is discussed next.

Ethnicity

The ethnicity/race reported by the participants in the study was comprised of the

following: (a) White/Non-Hispanic (75.9%, $n = 198$), (b) African-American (11.1%, $n = 29$), (c)

Hispanic (3.8%, $n = 10$), (d) Asian (3.1%, $n = 8$), (e) Pacific Islander (.4 %, $n = 1$), (f) Biracial

(3.1 %, $n = 8$) and (g) other/not specified (2.7%, $n = 7$). In comparing the ethnic characteristics

of ethnicity to similar studies, Bishop and Bieschke (1998) study with counseling psychology

students ($n = 184$) had 81% of the participants reporting their ethnicity as Caucasian. Rawls

(2008) surveyed 245 participants and 75.9% of the participants reported their ethnicity as

Caucasian or European American. Love, Bahner, Jones, and Nilsson (2007) study was comprised

of 131 counseling psychology doctoral students with 68.6% ($n = 94$) identifying as White/Non-

Hispanic. Kahn (2001) surveyed 149 doctoral students in APA accredited counseling psychology

programs and (80%) in the study identified as Caucasian. The results in this study for ethnicity

were similar to other studies with Caucasian being the highest representation of ethnicity/race.

The next section discusses the location of the participants in the study and the counselor

education area of specialization.

Geographic Representation and Specialization

The participants involved in this study were from a national sample of counselor

education doctoral students enrolled at 24 CACREP universities nationwide. The 24 universities

were in 29 out of 50 U.S. states. Vaccaro (2009) reported 19 out of 50 states represented in her

study. Rose (1999) included a sample of 250 doctoral students from different disciplines on what

students look for on an ideal mentor in two research one universities. The study reported on the

participants' citizenship with the majority of the participants being US citizens (83%). The

remaining citizenship of the participants was from Canada (6%), the People's Republic of China (5%), Greece (4%), Italy (1 %), and Bangladesh (1%).

On the demographic characteristic of counselor education area of specialization, the majority of the participants responded that mental health/community counseling (50.6%, $n = 132$) as their area of specialization. The four other areas of specialization of marriage and family counseling (10.0%, $n = 26$), school counseling (18.8%, $n = 49$), counselor education and supervision (5.7%, $n = 15$), and other (14.9%, $n = 39$) were similar. Lambie and Vaccaro (2011) was the only other study that reported the demographic of counselor area of specialization in their study with mental health/community counseling (51.7%, $n = 46$) as the largest number of reported area by the participants. The next demographic discussed is professional aspirations.

Professional Aspirations

The participants reported becoming a tenure track/faculty in counselor education (65.1%, $n = 170$) as the most frequented response for this demographic. The remaining three categories for this demographic (i.e., instructor/non-tenure track, practitioner, and other) were similar in response rate (11.5%, 10.7% and 12.6% respectively). Bishop and Bieschke, (1998) study with 184 doctoral counseling psychology students, 64% of the participants in their study reported practice as their career aspiration followed by 24% reporting indicating teaching and only 5.6% reporting research as a career aspiration. In Rawls (2008) study with 245 counselor education doctoral students, the career aspiration to be faculty member 139 (56.7%) was similar to those reported by participants in similar studies (e.g. Bishop & Bieschke, 1998). The next section discussed the demographic of scholarly activity.

Scholarly Activity

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The scholarly activity reported by the participants in the study demonstrated limited scholarly activity with 59.4% (*n* = 155) who reported they did not have any scholarly publications. The scholarly activity involving presentations at conferences was observed to be different with the majority of participants in the study (62.1%, *n* = 162) reporting they had been involved in presenting at conferences. The results for scholarly publications was observed to be smaller than Lambie and Vacarro (2011) who reported a larger majority of not having scholarly publications (69 .7%. *n* = 62) with over half (53.9%, *n* = 48) that had presentations at the national level. Bieschke, Bishop and Herbert (1995) surveyed 93 rehabilitation doctoral student participants and reported on their involvement in research projects. The participants in their study averaged involvement of 2.4 and a mode of O for research projects. Rawls (2008) study included 245 participants in counselor education whose reported scholarly activity was slightly above half the total sample (51.3%, *n* = 134) for submission to a scholarly journal. Rawls' study reported a greater frequency of scholarly activity when presenting at a state, regional, or national conference (82.8% or 216 students). As consistent with similar studies, scholarly activity is limited for doctoral students when it concerns publications but increases when it is involved in presentations at national, state, or other related venues. The next section reviews the number of doctoral-level research courses taken.

Number of Doctoral-level Research Courses Taken

The most frequent number of doctoral-level research courses reported completed by the students in this study was between 3 to 4 courses (39.8%, *n* = 104) followed closely by 5 or more completed courses (30.6%, *n* = 80). There were a total of 14 participants (5.4%) who reported that they had not completed a doctoral-level research course at the time of the study. The average

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number of research courses completed by the participants was 3.65 courses. In Rawls (2008) study, 34.7% of the participants had five or more research courses and 24.1% of the participants had four research courses. Bieschke and colleagues (1995) identified that rehabilitation doctoral students ($N = 93$) reported that the average number of research courses completed was 3.6 and the majority of those courses were quantitative. Vaccaro (2009) study using 89 participants in counselor education reported 1 to 2 courses as the highest percentage (42.7%, $n = 38$) of doctoral research courses taken. The results reported by Vaccaro for number of research courses taken was a contrast to the current study were most of the participants had completed between 3 to 4 courses as the most frequent. The contrast may be accounted for due to the results of this study having the majority of participants (47.5%, $n = 124$) be in their third year of higher of study and in the Vaccaro study, 37.0%, ($n = 33$) of the participants in the study were in their third year or higher. The next section reviews the years of post-graduate counseling experience of the participants prior to beginning their doctoral program.

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

The most frequently reported years of counseling experience reported by the participants in the study was between 0 to 4 years (72.0%, $n = 188$). The years of experience ranged from 0 years to 25 years of experience with a mean score of 4.08 years ($SD = 5.33$). Black (1998) surveyed 229 counselor education students and found that the majority of participants (48.2 %) had from one to three years of post-master's counseling experience. There were 20.1% of the participants who reported that they had 10 or more years of post-master's counseling experience.

In Tang and colleagues (2004) study, 116 counselor education doctoral students were surveyed. The study involved both CACREP and Non-CACREP programs and the researchers

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found that for the CACREP programs, 0 to 5 years of experience was the most frequent response (41.0%, $n = 46$) which was similar for the Non-CACREP programs (42.0%, $n = 47$). The average work experience for CACREP students was 2.19 years compared to 3.48 years of experience for non-CACREP students. The results of this study for years of experience compared with other studies suggest that students' average between 0 to5 years-experience when they start a doctoral program in counselor education. The next section reviews the demographic characteristic of whether or not the students were employed in a cohort model.

Counselor Education Doctoral Program Track and Cohort Model Employed

The results from the demographic question of whether or not students were in a cohort model for their respective model had the majority (77.0%, $n = 201$) reporting that their program employed a cohort model. The majority of the participants reported that the degree track for their program was a Ph.D. (85.1%, $n = 222$). The remaining responses reported by the participants was 14.6% ($n = 38$) for an Ed. D track and one response (.4%) as other. Results from this demographic were comparable to Vaccaro (2009) who reported 68.5% ($n = 61$) being in a cohort model and the majority of participants (89.9%, $n = 80$) reporting their program of study was a Ph.D. Similar studies did not report on this demographic of cohort model and degree track. The next section discussed the highest degree completed and graduate program completed.

Highest Degree Completed and Graduate Program Completed

Concerning the highest degree completed, the highest percentage reported by the participants was a Master of Arts (M.A.) degree with 41.8% ($n = 109$). The next highest percentage reported was Master of Education (M.Ed.) degree with 24.1% ($n = 63$). The type of degree completed was highest for M.A. in counselor education (34.5%, $n = 90$). The only other

study in the literature that reported on these two demographics (i.e., highest degree and graduate program completed) was Vaccaro (2009) who reported that the majority of participants (52.8%, $n = 47$) completed Master of Arts (M.A.) degree as the highest response. The next section reviews the demographic variables of the doctoral students self-rating of research competency, interest in research methodology, and rating of their research mentor.

Self-Rating of Research Competency, Interest in Research Methdology, and Research Mentor

Regarding the self-rating of research competency, the highest percentage derived from the rating of a 3 (55.5%, $n = 145$) followed next by a rating of 1 - 2 (43.6%, $n = 114$) with a mean rating of 2.57. The participants self-rating of their interest in research methodology had the highest percentage of participants reporting a rating that was 3 to 4 (77.7%, $n = 203$) with a mean score of 3.15. The participants rating of their research mentor had the highest percentage of 3 to 4 (68.5%, $n = 179$). In review of the literature, there were no other studies that had this demographic addressed in their studies.

The demographic variables summarized above were made available in order to show the comparison that was occurring between the doctoral student's participants demographic variables (i.e., age, gender, level of education, scholarly activity, race/ethnicity, location of program, number of doctoral-level research courses taken, professional aspiration, area of counseling specialization, cohort model employed, counselor education program track, highest degree completed, graduate program completed, self-rating of research competency, interest in research methodology and rating of their research mentor). Demographic variables from similar studies were included in the presentation of demographic variables for comparison purposes. The next section discusses the research Null Hypothesis.

Discussion of the 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*), interest in research (as measured by *Interest in Research Questionnaire*) and research mentoring (as measured by the *Research Mentoring Experiences Scale*) in counselor education doctoral students. The first research null hypothesis was analyzed using Multiple Linear Regression. The first analysis yielded results that showed a statistically significant correlation between research self-efficacy and interest in research scores ($r = .372$, $p < .001$), and a statistical significant correlation between research self-efficacy and research mentoring scores ($r = -.243$, $p < .001$). The effect size for the correlation between research self-efficacy and interest in research was moderate ($r^2 = .138$) while the effect size for the relationship between research self-efficacy and research mentoring was small ($r^2 = .022$). No statistical significant correlation was observed regarding the relationship between interest in research and research mentoring. The results of this correlation suggest that when the doctoral students' interest in research scores increased, so did their research self-efficacy. Additionally, the results also suggested that when research mentoring scores increased, the research self-efficacy scores decreased. When comparing the results for this study to other studies, there were noted similarities as well as some differences. Rawls (2008) surveyed 577 student members of the ACES reported similar results between research mentoring and research self-efficacy scores. In Rawl's study, a significant statistical relationship was observed ($r = -.254$, $p < .001$) between research self-efficacy and research mentoring. Higher research mentoring scores yielded lower research self-efficacy and lower research mentoring

scores revealed higher scores of research self-efficacy. Similar results were obtained by other researchers. Kahn (2001) sampled 149 counseling psychology doctoral students and found that research in interest was correlated with research self-efficacy ($r =.29$, $p < .001$) and research mentoring ($r =.21$, $p < .001$). The results in Kahn's (2001) study was different from this study in that when mentoring scores increased, so did scores on research self-efficacy. It should be noted that Kahn used a modified form of the *Mentoring Functions Scale* (MFS; Noe, 1988) using 10 items of the original 29 items. Vaccaro (2009) surveyed 89 counselor education doctoral students and the only significant relationship observed was between research self-efficacy and interest in research scores ($r = .385$, $p < .001$). The Bard et al., (2000) involved two independent studies with on rehabilitation counseling doctoral students and faculty members ($n = 223$). Bard and colleagues found that there was a significant correlation observed between research self-efficacy and research interest for faculty ($r = .28$, $p < .001$) but not for doctoral students. Phillips and Russell found that there was a significant statistical correlation between research self-efficacy and the research training environment ($r = .39$, $p < .001$) and research self-efficacy and research productivity ($r = .45$, $p < .01$) scores

The findings in the current study showed that a significant relationship was evident between research self-efficacy and interest in research. The results also showed that there was a significant relationship between research self-efficacy and research mentoring which was consistent with Rawls (2008). Other studies (e.g. Kahn, 2001) indicated a relationship between research interest and research mentoring whereas the present study did not observe a significant relationship between these constructs. Bard et al., (2000) outcome expectations of research play an important role in the developing the research interest and research self-efficacy of doctoral

students and faculty. Warnke, Bethany, and Hedstrom (1999) suggested that advice for doctoral students on how to obtain professorates should occur early in the doctoral training. Mentoring of doctoral students should follow a formal method to ensure that doctoral students in counseling can make the transition from student to faculty (Borders et al., 2011; Maples & Altekruse, 1993). When research experience occurs earlier for students, their research self-efficacy and research interest are likely to increase over time. The faculty should encourage students to have involvement in research-related activity and foster this development since a lack of research activity tends to decrease self-efficacy in research and interest in research. The mentoring of students helps to ensure that students are developing accordingly (Hollingsworth, 2000; Love, et al., 2007). Encouraging research activity should not be limited to just scholarly publications that are quantitative, they can include qualitative studies as well as professional presentations at conferences (Okech, et al., 2006). The Null Hypothesis 2 is discussed in the next section.

Null Hypothesis 2

The second research null hypothesis conjectured 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*) and research mentoring (as measured by the *Research Mentoring Experience Scale*) between counselor education students who have completed their first year, second year and third year (or greater) of study. Research self-efficacy, interest in research and research mentoring were treated as individual dependent variables in the ANOVA analysis. The results of this analysis indicated that the students reported year in their doctoral counselor education preparation program had a statistically significant effect on research self-efficacy scores at the .05 level of significance F (7,

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229) $= 4.186$, $p < .001$ for this data. The students reported year in their doctoral preparation program did not influence their interest in research and research mentoring scores. Comparisons with other studies regarding the effect of year of study and research self-efficacy and interest in research are discussed next.

The results of this study was consistent with Phillips and Russell (1994) who had a sample of 125 doctoral students in APA counseling psychology programs in their first, second and fourth year and beyond of study. Phillips and Russell found that advanced doctoral students had greater research self-efficacy and more research productivity than the counterparts in the first and second year of study. It should be noted that the third year students were excluded from the analysis. Phillips and Russell had a diverse representation for year of study (excluding third year) with first and second year students representing 44.8% (22.4% each respectively) of the total sample and fourth year and beyond representing 14.4% of the sample. In comparison, the highest representation of year of study was in the third year or higher (47.5%, $n = 124$) with similar representations of first year (20.7%, $n = 54$) and second year (23.0%, $n = 60$). Phillips and Russel did not find a statistical significance for the research training environment and year of study. Kahn (2001) did not find a statistical relationship between year in doctoral program and research self-efficacy.

Vaccaro (2009) found similar results with no observed statistical difference for year of doctoral education and research self-efficacy scores. In Vaccaro's study, 37% ($n = 33$) was represented by third year students. Kahn and Scott (1997) surveyed 267 doctoral students in counseling psychology and found the year in program did predicted research self-efficacy, interest in research, and research productivity. A difference in the Kahn and Scott study from the

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present study was the use of research productivity which they reported was not predicted by research self-efficacy. Results were comparable to other studies for research self-efficacy (e.g. Kahn & Scott, 1997; Phillips & Russell, 1994) but exceptions can sometimes be observed where year of program does not have a statistical significant relationship with research self-efficacy (e.g. Vaccaro, 2009). The differences in these results could be accounted for by sample size or student demographic. For example, Vaccaro, (2009) had 89 doctoral students in counseling education while Kahn and Scott (1997) surveyed 267 doctoral students in counseling psychology (a related but different discipline). Based on the results of this analysis, it can be suggested that the year of doctoral study has an effect on research self-efficacy but it does not influence interest in research and research mentoring in doctoral students in counselor education. The next section discussed the results of the analysis for the Null Hypothesis 3.

Null Hypothesis 3

The third research null hypothesis stated that there was no statistically significant relationship between research self-efficacy (as measured by *The Research Self-efficacy Scale*), interest in research (as measured by *Interest in Research Questionnaire*) and Research Mentoring (as measured by the *Research Mentoring Experience Scale*) 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, professional aspirations, and self-ratings of research methodology, interest in research methodology and mentor rating). The third research hypothesis was analyzed using MLR. The dependent variables in the MLR procedures were research self-efficacy, interest in research and research mentoring scores. The independent variables in the study were the doctoral student

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demographic variables. The demographic variables were run in three separate ANOVA procedures for each dependent variable. The results of each of the MLR procedures are discussed next.

The MLR results indicated that the effect of the demographic variables on Research Self-Efficacy scores were significant at the .05 level with $F (27, 257) = 2.390$, $p < .001$ for the model. Since the results were observed to significant, a follow-up ANOVA was run for each of the demographic variables to confirm the results that were ran in the MLR procedures.

The results of the analysis indicated that scholarly activity had a statistically significant effect on RSES scores at the .05 level of significance ($p = .013$, $\eta^2 = .114$) for these data. No statistical significant observation was observed for the demographic variables of gender, age and years of counseling experience. Scholarly activity was also found to have a statistical significant effect on IRQ scores at the .05 level of significance ($p = .009$, $n^2 = .127$). Similarities were observed in other studies. For example, Kahn (2001) found a statistical significant relationship between research self-efficacy and research productivity. Kahn found that research self-efficacy actually predicted research productivity ($r = .22$, $p < .01$). Vaccaro (2009) found that there was a statistical significance for scholarly activity ($p = .001$, $\eta^2 = .134$) and research self-efficacy but not for the other demographic variables (i.e., gender, age and experience). In Kahn and Scott (1997) study, gender was found to not have a significant statistical influence on research interest and research productivity but it did on research self-efficacy scores. In the study by Hollingsworth and Fassinger (2002), the gender of the student did not have a significant statistical relationship with research self-efficacy. Phillips and Russell (1994) study included 125 doctoral students in counseling psychology. They concluded that the participants' gender did not

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have a statistical significance with research self-efficacy scores research productivity scores and the research training environment. Rawls (2008) surveyed 577 student members of the ACES and found that no statistical significance was present on gender differences research self-efficacy. Rawls did find gender differences for research mentoring experiences. Male students scored lower on research mentoring experiences than female students which was different than the present study where there was no observed statistical difference on research mentoring between males and females. Bishop (1995) found that age (beta = -.11; p = .17) nor gender (beta = .03; p = .68) had a significant effect on research self-efficacy scores. The number of research courses taken was shown to have a significant statistical effect at the .05 level (p < .001, η^2 = .095) on research self-efficacy scores. Vaccaro (2009) did not find significant statistical relationships between research self-efficacy scores and the demographic variables of race/ethnicity, specialization, research courses taken, and professional aspirations. Rawls (2008) found that no statistical significance was present for the effect of ethnic differences for research self-efficacy. The results of this analysis indicated observed a statistical significant effect of RMC on research self-efficacy (p < .001, η^2 = .421) and RM (p = .025, η^2 = .142). The independent variables IRM and location did not have a statistical significant effect on research self-efficacy. When research self-efficacy was treated as the dependent variable, PRM had a significant effect on research self-efficacy scores (p = .032, η^2 = .020) as did QI (p = .004, η^2 = .036). No statistical significant relationship was observed between QLI, cohort, and degree track on research self-efficacy scores. The analysis using interest in research as the dependent variable is discussed next.

The results of the MLR results indicated that the effect of the demographic variables on Interest in Research scores was significant at the .05 level with $F(27, 258) = 2.390$, $p = .001$ for the model. Since the relationship in the model was shown to be significant, a follow-up ANOVA was run on each set of the demographic variables to verify the results run under the MLR procedures..

When interest in research was treated as the dependent variable, no significant relationship was observed between gender, age, and counseling experience. A significant statistical relationship was observed for scholarly activity ($r = .127$, $p < .009$) and interest in research. Results were comparable to other studies. Bard et al., (2000) did not find a significant relationship between gender and interest in research. Vaccaro (2009) did not observe a statistical significant relationship between interest in research with gender, age, counseling experience and scholarly activity. Based on the results, the variables of gender, age, and experience do not have an influence on interest in research. Results from this study were consistent with results from other studies (e.g. Bard, et al., 2000; Vaccaro, 2009) where gender, age, and counseling experience did not have a statistical effect on interest in research. A noted difference from prior studies was that in the current study, scholarly activity was shown to have a significant effect on interest in research whereas in Vaccaro's (2009) study, it did not. No statistical significance was observed for ANOVA's using the dependent variables of interest in research and the demographic variables (race/ethnicity, CES, number of research courses taken and career aspirations). Bard et al., (2000) found that ethnicity did not have a statistical significant relationship with interest in research for doctoral students but it did for faculty ($r = .25$, $p < .01$). A significant statistical significance was observed for IRM ($p < .001$, $\eta^2 = .412$) and Interest in

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Research. No statistical significant relationship was observed for RMC, RM when interest in research was treated as the dependent variable. When interest in research was treated as the dependent variable, cohort was the only variable with a statistical significant effect ($p = .007$, $\eta^2 = .031$) on interest in research scores. The results of the MLR analysis treating research mentoring as the dependent variable and the demographic variables as the independent variables is discussed next.

The results of the MLR procedures indicated that the effect of the demographic variables on Research Mentoring scores were not significant at the .05 level with $F (27, 257) = .915$, $p = .589$ for the model. Since the relationship in the model was shown to not be significant, no follow-up ANOVA procedures were was run on the data.

When treating research mentoring as the dependent variable, no significant relationship was observed for gender, age, counseling experience and scholarly activity. The results for gender and mentoring were similar to Gattis (2008), who did not find a significant effect for gender with regards to mentoring. Gattis had surveyed 219 doctoral students from Midwestern University using the *Ideal mentor scale* (IMS; Rose, 2003) and the *Alleman Mentoring Activities Questionnaire* (AMAQ; Alleman & Clarke, 2002). Hollingsworth and Fassinger, (2002) also found that that gender did have a significant effect on mentoring. Consistent with similar studies, gender did not have a significant effect on research mentoring.

The analysis using the three demographic variables of RMC, IRM, and RM were unique to this study. Additionally, the analysis using research self-efficacy, interest in research, and research mentor with the variables of PRM, cohort, QI, QLI, and degree track were also unique to this study. While other studies reported on the demographic information regarding the

geographic region of the participants and cohort model (e.g. Rose, 1999; Vaccaro, 2009), the studies themselves did not discuss the location and cohort's statistical impact on research self-efficacy, interest in research and research mentoring. The discussion of research null hypothis four is discussed next.

Null Hypothesis 4

The research null hypothesis 4 indicated that there would be no improvement in the MLR results after running structural equation modeling. After running the confirmatory analysis in SEM, the results were not prudent enough to justify continuation of

SEM. The relationship observed between research mentoring and research self-efficacy run on SAS ($r = -.264$, $p < .01$) was not observed to be an improvement from the relationship observed from the regression analysis between research self-efficacy and research mentoring ($r = -.243$, $p < .01$).

This concludes the data analysis for the four research questions and null hypothesis. The overall findings of the study are discussed in the following segment.

The participants in the current study varied with regards to scholarly activity when it was defined by publications (59.4%, $n = 155$) or by presentations (62.1%, $n = 162$) in national, international or state conferences. Results from this study are consistent with other studies. Rawls (2008) study included 245 participants in counselor education scholarly activity was similar to the present study (51.3%, $n = 134$) for submission to a scholarly journal with a higher number of scholarly activity when presenting at a state, regional, or national conference (82.8% $n = 216$ students). Lambie and Vacarro (2011) identified that the majority counselor education doctoral students ($N = 89$) reported not having scholarly publications in national refereed

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journals (69 .7%. $n = 62$). The scholarly activity in the study had an impact on research self-efficacy scores ($p = .013$, $\eta^2 = .114$; 11.4%). Comparable studies (e.g., Bieschke et al., 1996) saw an increase in research self-efficacy when scholarly activity increased.

Concerning the number of doctoral research courses completed in the current study, the majority (39 .8%. $n = 104$) had completed between three to four doctoral research courses with five courses (30 .6%. $n = 80$) being the next most frequent courses completed. This result contrasts the results of Vaccaro (2009) who found that the majority of participants had completed between one to two doctoral research courses. Rawls (2008) found similar results where 34.7% of the participants had five or more research courses. The number of research courses completed had a significant statistical effect on the variable of research self-efficacy ($p < .001$, $\eta^2 = .095$) but not on interest in research and research mentoring.

The current study observed a significant statistical relationship between the three variables of research self-efficacy, interest in research and research mentoring. A statistical significant relationship was observed for research self-efficacy and interest in research ($r = .372$, $p < .01$) and research self-efficacy and research mentoring ($r = -.150$, $p < .01$). Interest in research and research mentoring did not have a significant statistical relationship. Results for the relationship between research self-efficacy and research mentoring were similar to the results of Rawls (2008) who observed a significant statistical relationship ($r = -.254$, $p < .001$) between research self-efficacy and research mentoring. The results from this study and the Rawls' (2008) study would suggest that increases in research mentoring will decrease research self-efficacy. An interesting observation of the current study was the variables of age, gender, and counseling

experience had no impact on the variables of research self-efficacy, interest in research and research mentoring.

There were no significant statistical observations observed for gender and research mentoring. Hollingsworth and Fassinger (2002) also found no differences for gender on research mentoring, which was incongruent with Rawl's (2008) findings that gender was influenced by research mentoring experiences. Male students scored lower on research mentoring experiences than female students which was different than the present study where there was no observed statistical difference on research mentoring between males and females.

Interest in research was significantly influenced by scholarly activity ($p = .009$, $\eta^2 = .127$) rating of research methodology competency (RMC; $p = .016$, $\eta^2 = .133$) and rating of interest in research methodology (IRM; $p < .001$, $\eta^2 = 412$) but not by the other demographic variables. It is important to note that the three variables of rating where created for this study.

The variable of research self-efficacy was influenced by scholarly activity ($p = .013$, $\eta^2 = .114$) for these data. No statistical significant observation was observed for the demographic variables of gender, age and years of counseling experience. Similarities were observed in other studies. Kahn (2001) found that research self-efficacy actually predicted research productivity ($r = .22$, $p < .01$). Vaccaro (2009) found that there was a statistical significance for scholarly activity ($p = .001$, $\eta^2 = .134$) and research self-efficacy. When compared to other studies, research self-efficacy is impacted by scholarly activity. The more involved students are in research, the more confident they are in completing research. The participants in the study had an average 2.97 rating of their respective research mentor. Research mentoring negatively affected ($r = -.150$, $p < .01$) research self-efficacy. One possible interpretation of this result was the

mentoring relationship between the doctoral student and their research mentor was not causing

the doctoral students' research self-efficacy to improve. The next section discussed the

limitations of the study.

Potential Limitations

While there were findings in this study consistent with other studies, limitations were

present that reduce inferences in interpreting the results. The current study was non-experimental

in design; the investigation employed a cross-sectional, ex-post facto, correlational research

design. Studies that are not by nature experimental, a cause and effect (or causality) cannot be

inferred as a result since the research is related to the associations that the research observes

between the variables (Sproull, 1995). The study did not involve random sampling; but rather

employed purposive sampling.

A second limitation was the response rate of the participants. The current study involved

a program response from 24 out of 59 CACREP programs or a program response rate of 40.7%.

Kahn and Schlosser (2010) had a program response rate of 35% ($N = 120$). Of the total 261

participants in the study, 18 surveys were from mailed in responses. The 18 surveys were

returned (20 % response rate) from a total of 90 packets that were sent out to potential

participants. The response rate of the mailed surveys was less than comparable studies. For

example, Okech et al., (2006) who had a 39.7% ($n = 167$) response rate in their study. One

problem with response rates is that there is a tendency to attract respondents who are more likely

to participate. In most studies, involving investigative research, females tend to volunteer more

frequently than males in research studies (Porter, & Whitcomb, 2005). In addition, the selection

of participants was not random. Random selection adds more reliability to a study and is more

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representative of a population than other sampling procedures, in which random sampling is not conducted (Crowl, 1996; Siebert, 2006).

The results of the study were specific to counselor education doctoral students who were enrolled in CACREP accredited programs. Non-CACREP programs were not included in the current study. Results from the analysis in this study may not be representative of students from non-CACREP programs. Additionally, the results of the study cannot be inferred to doctoral students in different disciplines. The current study only examined the research self-efficacy, interest in research, and mentoring experiences of doctoral students in counseling education. Other areas of doctoral student educational experiences that can impact their research (e.g. time involved learning about teaching and supervision) were not investigated. Activities of teacher training and supervision are an integral part of the training of doctoral students in counselor education (Borders et al., 2011; Warnke, Bethany & Hedstrom, 1999).

Another limitation of the study was that it was ex-post facto in design. Ex-post-facto research designs are studies in which variables are examined after they have occurred. The variables are not manipulated by the experimenter. The direction of causality cannot be determined in ex-post facto research. (Cohen, Manion, & Morrison, 2007; Oyster, Hanten, & Llorens, 1987). The self-report on the research items by the participants is a limitation of the study. Self-report on instrument items has limitations since it is based on how a participant will view a particular item which is not necessarily consistent with how other participants viewed the value of the same item (Oyster, Hanten, & Llorens, 1987). A final limitation of the study was the administration of the survey packets themselves. Survey packets were administered via both standard mail method and electronic survey method. Dillman, Smyth, and Christian, (2009)

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argue that differences in reliability may occur when having survey results that are mailed survey versus electronic methods. A comparison between the returned mailed surveys ($n = 18$) versus the electronic survey responses ($n = 243$) was not made since there was a large disparity between the number of mailed surveys and electronic surveys. A larger representation of mailed in survey responses would allow for a better comparison between the two responses.

Recommendations for Future Research

Research competency and development of counselor education doctoral students is an underserved area of research in counselor education (Lambie & Vaccaro, 2011). Based on the results of this study, there are recommendations for additional research to help add to the knowledge with respect to counselor education and doctoral student development in the area of research. One of the primary interests of this study was to examine the relationship between research mentoring, a specific component of the research training environment (Gelso & Lent, 2000; Hill, 1997; Hollingsworth & Fassinger, 2002) and research self-efficacy. The current study indicated that there was a significant statistical relationship between research self-efficacy and research mentoring. The relationship was an inverse relationship (negative correlation) which suggests that when research mentoring increases, research self-efficacy decreases. An interpretation of this finding is that students may become dependent on their research mentors and less self-efficace of their own research abilities. Rawls (2008) saw similar results for this relationship using the same *Research Mentoring Experiences Scale* (RMES; Hollingsworth & Fassinger, 2002), which was the same instrument used in this study. A recommendation would be to conduct a similar study using related but different instruments in order to determine if the relationship is consistent or unique to this study and Rawls' (2008) study.

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The current study was quantitative in nature. A qualitative study would be recommended to understand the greater description of the relationship of research mentoring with research self-efficacy. Qualitative studies allow the researcher to examine more intimate details or phenomenon that a quantitative study does not readily explain (Ary, Jacobs, & Sorenson, 2010). Vaccaro, (2009) recommended qualitative studies with counselor education doctoral students and their respective mentoring experiences in order to further explore the dynamic that exists between the mentor and protégé. Since there are limited studies in the area of counselor education that examine research self-efficacy, interest in research and research mentoring, a replication of this study is warranted. One suggested recommendation would be to examine the mentoring experiences of doctoral students and how it compares to their overall training environment. Since the current study observed scholarly activity to be greater in the area of conference presentations than publications in scholarly journals, investigation comparing these two differences would be recommended. In order for doctoral students to be successful at the next level, programs need to ensure it is occurring for the student prior to the students becoming junior faculty (Borders et al., 2011; Lambie & Vaccaro, 2011).

Implications for Counselor Education and Supervision

The current study investigated three constructs (research self-efficacy, research interest in research, and research mentoring) as they related to counselor education doctoral students. The study included the investigation of the following demographic variables in relation to the constructs of interest: (a) Location of program, (b) Year in program, (c) gender, (d) race/ethnicity, (e) Age, (f) highest degree completed, (g) type of graduate program completed, (h) Counselor Education degree track, (i) cohort model employed in doctoral program, (j) area of

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specialization, (k) years of post-graduate counseling experience, (l) did you have research mentor

prior to starting program (m) graduate program completed, (n) number of doctoral research

courses taken, (o) career aspirations, (p) scholarly activity, (q) investigator/co-investigator

quantitative/qualitative study, (r) self-ratings (i.e. research competency, interest in research and

mentor). The implications that are discussed next are based on the subsequent results of the

study. The provision of the following implications is with the intent of promoting further study

in the area of doctoral student research in counselor education, specifically in the areas of

research self-efficacy, interest in research and the research mentoring experiences.

Demographic Characteristics of the Average Counselor Education Doctoral Student

The demographics of the doctoral counseling student participants in the study consisted of

female (75.5%, $n = 59$). The most frequented age group was 31 to 40 years of age (41.3%, $n =$

98) which was closely followed by the age group of 23 - 30 years of age (31.1%; $n = 81$). The

majority of the participants (47.5%; $n = 124$) in the study were in their third year or beyond in

their doctoral studies. The ethnic/race composition of the participants was comprised with the

majority (75.9% $n = 198$) being Caucasian/white (non-Hispanic). The majority of the participants

(17.2% $n = 45$) were from the state of Florida with the states of Virginia (11.5% $n = 30$) and

Ohio (10.0% $n = 26$) following next in state representation of participants. The majority of the

participants (41.8% $n = 109$) reported the highest degree completed as being a Master's of Arts

(M.A.). The majority of the participants reported that the type of degree completed (49.4% $n =$

129 was in counselor education with either a M.A. degree (34.5%) or M.Ed. degree (14.9%) in

the field of counselor education. There were a total of 52 participants (19.9%) who reported that

they had received a M.S. in counseling. The majority of the participants in the study (50.6% $n =$

132) reported their area of specialization as mental health/community counseling. The majority of the participants (39.8% $n = 104$) had completed between 3 - 4 doctoral research courses. There were a total of 75 participants (28.8%) who had completed between 0 to 2 doctoral level research courses. The number of doctoral level research courses taken was consistent with the other finding that the majority of the participants (47.5%) were in their third year or higher of doctoral studies.

The majority of the participants in the study (65.1% $n = 170$) reported their career aspirations to be counselor educator. The other career aspirations of other, non-Tenure track/instructor, and practitioner (12.6%, 11.5%, and 10.7% respectively) were closely represented by the remaining participants. The scholarly activity of the participants was observed to have the majority (59.4% $n = 155$) having no scholarly activity and the majority (62.1% $n = 162$) having presented at national, international or regional conferences. The majority of the students in the study (85.1% $n = 222$) reported that they were in a Ph.D. program track for counselor education. The majority of the participants (77.0% $n = 201$) reported that their program track was a cohort model.

The scholarly productivity of the students was found to have a statistically significant effect on research self-efficacy scores ($p = .013$, $\eta^2 = .114$) and interest in research scores ($p = .009$, $\eta^2 = .127$) but not on research mentoring scores ($p = .359$, $\eta^2 = .032$). The scholarly activity of the participants was able to explain 11.4% of the variance in the research self-efficacy scores and 12.7% of the interest in research scores in their respective models. Essentially, students with a greater frequency of scholarly activity have higher research self-efficacy. Research activity in university settings should be conducted that allows students to work collaboratively with a

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faculty advisor and independently with supervision in order to develop their research skills and confidence in conducting research (Eisenhart & DeHaan 2005).

Based on the findings in the study, one recommendation for doctoral programs in counselor education would be to both encourage and involve students in research activities that help them develop research skills to be successful in careers as faculty researchers (Borders, 2011). Counselor education programs need to develop methods by which students will be both encouraged to be involved in scholarly activity and gain confidence in their research abilities (Hollingsworth & Fassinger, 2002; Lambie & Vaccaro, 2011). Okech et al. (2006) surveyed 167 faculty members in counselor education on their respective research training received when they were doctoral students. Participants in the study reported there was a need for research training specific to both quantitative methodology and qualitative methodology which involved mentoring. Briggs and Pehrsson (2008) recommend that mentoring occur in the pre-tenured phase of counselor education in order to ensure that the field is maintaining its professional identity. Research self-efficacy and interest in research should be mentored. Mentoring is also a skill set separate from research skills that need further development. Doctoral students who are essentially taught how to be good mentors will more likely be good mentors when they become faculty (Hollingsworth and Fassinger, 2002).

The findings in this study saw a relationship between research self-efficacy and interest in research ($r = .372$, $p < .01$). Royalty and Reising (1986) contend that gaining confidence in research design and interest in research derives from students becoming involved in research projects early in their doctoral training and also working with other individuals who are successful at producing publications based on their research. Gelso (1993) argued that increasing

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interest in research and research self-efficacy will improve drastically when research behaviors are modeled by faculty. The results in the current study indicated that cohort models had an effect on interest in research ($p = .007$, $\eta^2 = .031$) for the participants. Love and colleagues (2007) study with 131 doctoral students in counseling psychology programs found that supportive peers and mentors contributed to positive research experiences predicting increases in research self-efficacy. Love and colleagues also found that such support from peers and mentors had the doctoral students more likely to engage in research activities.

Additional findings indicated that the demographic variable of number of doctoral research courses taken had a significant effect on research self-efficacy. The number of research courses taken did not have a significant impact on interest in research and research mentoring. The number of research courses taken had a significant effect on research self-efficacy. The age of the participants was not shown to have a statistical effect on research self-efficacy, interest in research and research mentoring. The finding that age had no significant effect on research self-efficacy, but number of research courses taken did, suggests that experience, not age is more of an influence on research self-efficacy.

While research mentoring and research self-efficacy had a statistical significant relationship ($r = -.150$, $p < .001$), research mentoring was not significantly affected by any of the demographic variables in the study with the exception of rating of research mentor ($p < .001$, η^2 =.424; 42.4%) which was created specifically for the study. Based on the findings of limited effects of the demographic variables on research mentoring, this researcher concurs with Hollingsworth and Fassinger, (2002) recommendation that additional investigation be conducted

into mentoring to further understand the relationship between research mentoring and research self-efficacy.

A final recommendation is on matching students based on their respective cohorts. The cohort of students did not have a significant impact on research self-efficacy and research mentoring. The cohort model did have a significant relationship ($p = .007$, $\eta^2 = .031$) with interest in research. Based on the finding of cohort model having a significant relationship with interest in research, a suggestion would be for programs to consider the overall composite of the cohort (if cohort model is used) when selecting students for doctoral studies. Cohorts could be blended with regards to vocational preferences (Mallinckrodt, Gelso, & Royalty, 1990; Royalty & Magoon, 1985; Webb, 2004) which would contribute to the success of the cohort and the individual student.

Summary

In summation, this study examined the specific constructs of research self-efficacy, interest in research, and research mentoring using a national sample of counselor education doctoral students. The current study was conducted with the intent of adding to the limited research in Counselor Education concerning research of doctoral students. Research self-efficacy was correlated positively with interest in research and negatively with research mentoring. Interest in research and research mentoring did not have a statistically significant relationship. The demographic variable of number of doctoral research courses taken had showed a significant relationship with research self-efficacy. Scholarly activity was also shown to have a significant relationship with research self-efficacy and interest in research. Experience in research increases doctoral students in counselor education confidence in conducting research activity. While

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experience can lead to greater self-confidence in conducting research, the opportunity to conduct

research should be available.

APPENDIX A: INTEREST IN RESEARCH QUESTIONNAIRE (IRQ)

Interest in Research Questionnaire (IRQ)

Using the 5-point Likert 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**

Degree of Interest Rating	Research Activity
	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/educational 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.

Bishop, R. M. & Bieschke, K. J. (1994). *Interest in Research Questionnaire*. Unpublished scale, The Pennsylvania State University.

APPENDIX B: RESEARCH MENTORING EXPERIENCE SCALE (RMES)

Research Mentoring Experiences Scale

Faculty often play an important role in students' research training and research experiences. Some students receive their most significant research experiences with their formally assigned advisor, while others receive their most important research mentoring through more informal faculty relationships. If you do not have anyone that you consider as a faculty mentor, please consider the faculty relationship that has been most important in your research training while in your current doctoral program, and use the following items to describe your current perceptions of this relationship. It is important that you consider your relationship with only one faculty member in completing this survey. Not all of these behaviors are important to all students or faculty, so please indicate "N/A" for those behaviors that are not present in your relationship.

You will need to provide a response to the stem in each column, circling the appropriate number in each column.

Research Task Functions	IN YOUR RESEARCH RELATIONSHIP WITH A SPECIFIC FACULTY MEMBER, TO WHAT EXTENT DOES HE OR SHE PAY ATTENTION TO THE FOLLOWING:					
	A Great Deal		Some		Very Little	Not Applicable
1. discussing your research-related goals?	5	4	3	2	1	N/A
2. helping you develop research ideas?	5	4	3	2	1	N/A
3. involving you in one or more specific research projects?	5	4	3	2	1	N/A
4. exposing you to different research methods?	5	4	3	2	1	N/A
5. reminding you that flaws in research projects are inevitable?	5	4	3	2	1	N/A
6. suggesting additional resources, such as people or literature, you can consult to improve your research?	5	4	3	2	1	N/A
7. helping you organize a review of the literature?	5	4	3	2	1	N/A

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Research Task Functions	IN YOUR RESEARCH RELATIONSHIP WITH A SPECIFIC FACULTY MEMBER, TO WHAT EXTENT DOES HE OR SHE PAY ATTENTION TO THE FOLLOWING:					
	A Great Deal		Some		Very Little	Not Applicable
8. helping you to identify weaknesses in a research project?	5	4	3	2	1	N/A
9. helping you develop a realistic timetable for research projects?	5	4	3	2	1	N/A
10. encouraging you to apply for research-related grants?	5	4	3	2	1	N/A
11. encouraging you to attend important professional conferences?	5	4	3	2	1	N/A
12. introducing you to her/his professional colleagues who have similar research interests?	5	4	3	2	1	N/A
13. encouraging you with presentations of research at professional conferences?	5	4	3	2	1	N/A
14. collaborating with you on joint research projects?	5	4	3	2	1	N/A
15. encouraging you to express your ideas in research meetings?	5	4	3	2	1	N/A
16. using his/her power to motivate you to complete research tasks?	5	4	3	2	1	N/A
17. offering positive feedback about your research work?	5	4	3	2	1	N/A
18. constructively criticizing your research work?	5	4	3	2	1	N/A

Research Task Functions	IN YOUR RESEARCH RELATIONSHIP WITH A SPECIFIC FACULTY MEMBER, TO WHAT EXTENT DOES HE OR SHE PAY ATTENTION TO THE FOLLOWING:					
	A Great Deal		Some		Very Little	Not Applicable
19. encouraging you to talk openly about anxieties or fears that interfere with research?	5	4	3	2	1	N/A
20. providing advice about how to manage feelings of frustration with research?	5	4	3	2	1	N/A
21. communicating interest in your ideas when you talk about research?	5	4	3	2	1	N/A
22. communicating respect regarding cultural differences in your relationship?	5	4	3	2	1	N/A
23. expressing appreciation for your contributions to research?	5	4	3	2	1	N/A
24. modeling competence in research-related skills?	5	4	3	2	1	N/A
25. observing connections between research and practice?	5	4	3	2	1	N/A
26. describing research as rewarding?	5	4	3	2	1	N/A
27. discussing his/her research dilemmas with you?	5	4	3	2	1	N/A
28. expressing enthusiasm for research?	5	4	3	2	1	N/A

Scoring:
Items 1 – 16 comprise the *Career Mentoring* subscale; these items describe specific information needed to complete research tasks.

Items 17 – 28 comprise the *Psychosocial Mentoring* subscale: these items describe the emotional components of research training, focusing upon the quality of the relationship between the faculty member and student.

One may use either subscale scores or a total score, depending on needs. Scores are calculated by summing responses and dividing by the number of items. Cronbach's alpha for the total score was .74 (Hollingsworth & Fassinger, 2002). Cronbach's alpha for the *Career Mentoring* subscale was .87 (Hollingsworth, 2000). Cronbach's alpha for the *Psychosocial Mentoring* subscale was .88 (Hollingsworth, 2000).

References:

Hollingsworth, M.A. (2000). The role of research training environment, past research attitudes, and mentoring relationships in predicting current research attitudes and behaviors (Doctoral dissertation, University of Maryland, 2000). *Dissertation Abstracts International – B, 61/04*, AAT 9967916.

Hollingsworth, M.A., & Fassinger, R.E. (2002). The role of faculty mentors in the research training of counseling psychology doctoral students. *Journal of Counseling Psychology, 49 (3),* 324 – 330.

APPENDIX C: RESEARCH SELF-EFFICACY SCALE – REVISED (RSES)

RESEARCH SELF-EFFICACY SCALE – REVISED

Think about your level of confidence in your ability to perform each behavior listed and place a **number in the blank to the right** of the item indicating the degree of confidence in your ability to successfully perform that behavior. Use the following scale to make your ratings.

| 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 |

No Confidence   Moderate   Complete
                                            Confidence   Confidence

1. How confident are you in your overall ability to complete a significant project? _____

2. Follow ethical principles of research. _____

3. Brainstorm areas in the literature to read about. _____

4. Conduct a computer search of the literature in a particular area._____

5. Locate references by manual search._____

6. Find needed articles which are not available in your library. _____

7. Evaluate journal articles in terms of the theoretical approach, experimental design

and data analysis techniques._____

8. Participate in generating collaborative research ideas. _____

9. Work interdependently in a research group. _____

10. Discuss research ideas with peers. _____

11. Consult senior researchers for ideas. _____

12. Decide when to quit searching for related research/writing. _____

13. Decide when to quit generating ideas based on your literature review. _____

14. Synthesize current literature. _____

15. Identify areas of needed research, based on reading the literature. _____

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0      10     20     30     40     50     60     70     80     90     100
```

No Confidence   Moderate   Complete
                                       Confidence   Confidence

16. Develop a logical rationale for your particular research idea. _____

17. Generate researchable questions. _____

18. Organize your proposed research ideas in writing. _____

19. Effectively edit your writing to make it logical and succinct. _____

20. Present your research idea orally or in written form to an advisor or group. _____

21. Utilize criticism from reviews of your idea. _____

22. Choose an appropriate research design. _____

23. Choose methods of data collection._____

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 _____

| 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 |

No Confidence   Moderate Confidence   Complete
                                                                    Confidence

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 D: INFORMED CONSENT

University of Central Florida
Department of Education
Consent to Participate in Research

Title of the Study:

Counselor Education Doctoral Students' Levels of Research Self-Efficacy, Interest in Research, and Research Mentoring: A Cross-Sectional Investigation

Principal Investigator: John Petko

Dear Doctoral Student:

My name is John Petko 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 Stephen Sivo, 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

John Petko at 407-823-0182 (e-mail jpetko2009@knights.ucf.edu), or my faculty supervisors,
Dr. Lambie(e-mail Glenn.Lambie@ucf.edu , University of Central Florida, College of
Education, Counselor Education Program, Orlando, FL, 32816-1250 or at407-823-2835 or Dr.
Sivo College of Education 407-823-4147 (e-mail ssivo@mail.ucf.edu).

Questions or concerns about research participants' rights may be directed to the UCF IRB office,
University of Central Florida Office of Research University of Central Florida Office of

Research & Commercialization, 12201 143Research Parkway, Suite 501, Orlando, FL, 32826-3246. The phone numbers are 407-823-2901 or 407-882-2276.

Sincerely,

John T. Petko
Doctoral Candidate
University of Central Florida

APPENDIX E: DEMOGRAPHIC QUESTIONNAIRE

Counselor Education Doctoral Students' Levels of Research Self-Efficacy, Interest in Research, and Research Mentoring: A Cross-Sectional Investigation

Directions: Please complete the following general demographics questionnaire (*all responses are anonymous*)**. Only complete those items that pertain to you. Thank you for your participation.**

Location of Doctoral Program (state): _____
Year of Doctoral Study:
(a) First Year ____; (b) Second Year ____; (c) Third Year ____;
(d) Other ____ (*please specify*) _____

Gender: (a) Female ____; (b) Male ____; (c) Other ____

Ethnicity:
(a) Caucasian/White (Non-Hispanic) ____; (b) African-American ____; (c) Hispanic ____;
(d) Asian-American ____; (e) Pacific/Islander ____; (f) Native-American ____;
(g) Biracial ____; (h) Other ____ (*please specify*)_____

Age: _____

Highest Degree Completed: (a) MA ____; (b) M.Ed. _____; (c) Ph.D. _____; (d) Other _____

Type of Graduate Program Completed (*e.g., M.A in Counselor Education, MEd Counselor Education, MS Psychology, other graduate degree*)
(specify):_____

Counselor Education Doctoral Degree Track: (a) Ph.D. ____; (b) Ed.D. ____; (c) Other_____

Does your counselor education doctoral program use a cohort model? (a) Yes ___ (b) No___

 Counselor Education Area of Specialization: (a) Marriage & Family Counseling _____;
(b) Mental Health / Community Counseling _____; (c) School Counseling _____;
(d) Other (please specify) _____

How many years of post-graduate counseling experience did you have prior to beginning your doctoral program (include part-time experience): _____ **years**

Did you have a research mentor while you were a master's student &/or research mentor prior to being your doctoral preparation program experience? (a) Yes _____ (b) No _____

Please Continue To the Next Page

If you answered "yes" to the above question, how would you rate your research mentoring experience? _____

1	2	3	4
Poor / Weak			Strong

How many doctoral-level research methodology courses have you completed (*e.g., Research Design Course, Qualitative Methods Courses, and Statistical Analysis Courses*):_____

What are your career aspirations following the completion of your doctoral degree:
(a) Tenure-Track Faculty Member ____;
(b) Non-tenure Track Faculty Member (e.g., Instructor) ____;
(c) Practitioner (e.g., counselor, supervisor) ____;
(d) Other ____ (*please specify*) _____

At this point, have you published ("in press" or "published") any manuscripts in refereed journal? (a) Yes ____; (b) No ____

If "Yes" – please specify your number of manuscripts published ("in press" or "published") in refereed journals per level:
(a) National/International Journal _____;
(b) Regional Journal _____;
(c) State Journal _____

At this point, have you presented a paper at a national/international refereed counseling-related conference (e.g., American Counseling Association Conference)? (a) Yes _____; (b) No _____

If "Yes" – please specify your number of papers presented at national/international refereed counseling-related conferences:_____

Have you been a primary investigator or co-investigator in a study employing quantitative research methodologies? (a) Yes _____; (b) No _____

Have you been a primary investigator or co-investigator in a study employing qualitative research methodologies? (a) Yes _____; (b) No _____

How would you rate your level of research methodology competency at this time? _____

1	2	3	4
Poor / Weak			Strong

How would you rate your level of interest in research methodology at this time? _____

1	2	3	4
Not Interested			Very Interested

How would you rate your research mentor in your doctoral preparation program? _____

1	2	3	4

APPENDIX F: IRB APPROVAL LETTER

Approval of Exempt Human Research

From: **UCF Institutional Review Board #1 FWA00000351, IRB00001138**
To: **John T. Petko** and Co-PI: **Glenn William Lambie**
Date: **January 23, 2012**

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

Dear Researcher:

On 1/23/2012, the IRB approved the following activity as human participant research that is exempt from regulation: Type of Review: Exempt Determination
Project Title: Counselor Education Doctoral Students' Levels of Research Self-Efficacy, Interest
        in Research, and Research Mentoring: A Cross-Sectional Investigation.
 Investigator: John T Petko IRB Number: SBE-12-08166 Funding
 Agency: Grant Title: Research ID: n/a Grant ID: *<Delete if none or*
 manually enter> IND or IDE: *<Delete if none or manually enter>*

This determination applies only to the activities described in the IRB submission and does not apply should any changes be made. If changes are made and there are questions about whether these changes affect the exempt status of the human research, please contact the IRB. When you have completed your research, please submit a Study Closure request in iRIS so that IRB records will be accurate.

In the conduct of this research, you are responsible to follow the requirements of the Investigator
                                        Manual.

                                        On behalf of Sophia Dziegielewski, Ph.D., L.C.S.W.,
                                        UCF IRB Chair, this letter is signed by:

Signature applied by Joanne Muratori on 01/23/2012 12:52:01 PM EST

                                        IRB Coordinator

APPENDIX G:

PROGRAMS PARTICIPATING IN THIS STUDY AS OF 1/31/12

PROGRAMS PARTICIPATING IN THIS STUDY AS OF 1/31/12

1. Argosy University (Sarasota, Fl and Washington D.C. locations)
2. Duquesne University
3. George Washington University
4. University of Florida
5. Georgia State University
6. Syracuse University
7. University of North Carolina – Greensboro
8. The Pennsylvania State University
9. Idaho State University
10. Loyola University
11. Mississippi State University
12. Old Dominion University
13. University of North Texas
14. Syracuse University
15. University of Akron
16. University of Alabama
17. University of New Mexico
18. University of Mississippi
19. University of New Orleans
20. University of Rochester
21. University of Tennessee-Knoxsville
22. University of Texas-San Antonio
23. University of Toledo
24. University of Wyoming

APPENDIX H: LETTER TO PROGRAM HEADS

Date: 9-22-11

Dear Dr. _____:

My name is John Petko 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 Stephen Sivo, 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. There have been published studies which explored these constructs with counseling psychology and clinical psychology doctoral students. There are limited studies that have been conducted specifically with Counselor Education doctoral 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. The data collection instruments will consist of demographic sheet and 3 survey instruments. The survey instruments will consist of surveys on interest in research, research mentoring environment and research self-efficacy. 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. If there is a more feasible method to include potential participants in the study, please let me know and I will be more than happy to make other arrangements with 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) 823-4880, JPetko2009@knights.ucf.edu.

Thank you for your assistance.

Sincerely,

John Petko, MA.
Counselor Education Doctoral Candidate
University of Central Florida

APPENDIX I: LETTER TO PROGRAM HEADS E-MAIL VERSION

LETTER TO PROGRAM HEADS (e-mail version)

Date: 9-22-11
Dear Dr. _____:

My name is John Petko 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 Stephen Sivo, 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. There have been published studies which explored these constructs with counseling psychology and clinical psychology doctoral students. There are limited studies that have been conducted specifically with Counselor Education doctoral 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. The data collection instruments will consist of demographic sheet and 3 survey instruments. The survey instruments will consist of surveys on interest in research, research mentoring environment and research self-efficacy. 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. If there is a more feasible method to include potential participants in the study, please let me know and I will be more than happy to make other arrangements with 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) 823-4880, JPetko2009@knights.ucf.edu.

Thank you for your assistance.

Sincerely,
John Petko, MA.
Counselor Education Doctoral Candidate
University of Central Florida

APPENDIX J: PERMISSION TO USE INSTRUMENTS

PERMISSION TO USE INSTRUMENTS

John,

Sure. You have my permission. Some information about the IRQ is attached. Also attached the OEQ in case that's of interest. Best, Kathy Bieschke

On Mon, Jun 20, 2011 at 10:00 PM, John Petko <jpetko2009@knights.ucf.edu> wrote:
Dear Dr. Bieschke:

My name is John Petko. I am a third year doctoral student preparing for my upcoming dissertation. My dissertation will be on Research Self-efficacy, research interests and the research mentoring environment. The students will be selected from CACREP programs throughout the country. In searching for instruments to use for my upcoming study, I discovered the instrument you were involved in its' creation. I would like to use your instrument in my study. I am writing to you to request permission to use **Interest in Research Questionnaire** for my dissertation. Thank you for your assistance. I look forward to hearing back from you.

Sincerely,

John T. Petko
Doctoral student
University of Central Florida

--
Kathleen J. Bieschke, Ph.D.
Professor, Director of Training
Counseling Psychology Ph.D. Program
306 CEDAR Building
University Park, PA 16802
(814) 865-3296
kbieschke@psu.edu
Center for Collegiate Mental Health: www.ccmh.psu.edu

Hi, John. I'm happy for you to use the instruments, and I've attached everything I have that I think will be helpful. If you have additional questions, don't hesitate to be in touch. The citations for the IBM doc and Table 4 should be my dissertation, as referenced on the RMES doc. Best wishes with your research!

Sincerely,

Merris

Merris Hollingsworth, Ph.D., ABPP
Senior Psychologist
Assistant Director
Coordinator, Predoctoral Internship

Center for Counseling and Student Development
261 Perkins Student Center
University of Delaware
Newark, DE 19716
(302)831-2141

---- Original message ----
>Date: Tue, 21 Jun 2011 02:13:05 +0000
>From: John Petko <jpetko2009@knights.ucf.edu>
>Subject: request to use Research mentoring Experiences Scale and Interest in Being Mentored Scale
>To: <merrish@UDel.Edu>
>
> Dear Dr. Hollingsworth:
>
>
>
> My name is John Petko. I am a third year doctoral
> student preparing for my upcoming dissertation. My
> dissertation will be on Research Self-efficacy,
> research interests and the research mentoring
> environment. The students will be selected from
> CACREP programs throughout the country. In
> searching for instruments to use for my upcoming
> study, I discovered Research Mentoring Experiences
> Scale (RMES), and Interest In Being Mentored Scale
> (IIBMS). I would like to use your instrument in my
> study. I am writing to you to request permission to
> use your Research Mentoring Experiences Scale
> (RMES), and Interest In Being Mentored Scale

> (IIBMS). I am also interested in the psychometrics
> of your scale (specifically the Construct validity
> (factor analysis); Content validity;
> Criterion-related validity). Any assistance you can
> provide would be most appreciated.   Thank you for
> you assistance.
>
>
>
> Sincerely,
>
>
>
>
>
>
>
> John T. Petko
>
> Doctoral Student
>
> University of Central Florida

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