RESEARCH MOTIVATION IN PROFESSIONAL PSYCHOLOGY DOCTORAL STUDENTS: EXAMINATION OF THE PSYCHOMETRIC PROPERTIES OF THE RESEARCH MOTIVATION SCALE

by

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ABSTRACT

Previous research suggests that the majority of clinical and counseling psychology doctoral students report low levels of research interest while in graduate school, and indicate little or no intention to pursue postdoctoral research despite having been trained within a scientist-practitioner model. Contextual and individual factors related to research interest, such as the research training environment (RTE) and self-efficacy, have been identified as potential contributors to research outcomes. Although these variables seem to be linked, many studies have found that they do not account for a substantial portion of variation in research interest. Recently, Deemer, Martens, and Buboltz (2010) developed the Research Motivation Scale (RMS) to explore underlying motivational dispositions that may be predictive of doctoral students' research interest. Their measure included three subscales: Failure Avoidance (FA), Intrinsic Reward (IR), and Extrinsic Reward (ER). The primary purposes of the present study were to obtain further evidence for the factor structure of the RMS using a sample of clinical and counseling psychology doctoral students, and to examine the relationship between types of motivation and research interest.

It was hypothesized that research motives, as measured by the scales of the RMS, would be significant predictors of research interest above and beyond the RTE. Results of factor analyses provided additional evidence for the factor structure of the RMS in a new sample of clinical and counseling psychology doctoral students. Hierarchical regression analyses demonstrated that IR and ER were significant positive predictors of research

interest above and beyond gender and RTE among counseling and clinical psychology students as well as the overall sample. FA was found to be a significant negative predictor of research interest in counseling students, but not of clinical psychology students. Overall, these findings lend support to the theory that underlying research motives may play an important role in predicting counseling and clinical psychology doctoral students' participation in research in their careers. Understanding the variables that predict doctoral students' desire to engage in research while in graduate school and beyond will help training programs improve their methods of training students as both scientists and practitioners.

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Author 

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ACKNOWLEDGMENTS

I have no doubt that without the people I love, I would not be where I am today.

To my parents: Thank you for always offering your support and encouragement to do my best.

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And finally, to Reese, my husband and best friend: Thank you for being there whenever I need you, no matter what.

CHAPTER ONE
INTRODUCTION

Importance of Conducting Research

Many scholars regard psychology, like all other sciences, as a field whose foundation should be firmly grounded in scientific investigation (e.g., Bieschke, Fouad, Collins, & Holonen, 2004; Gelso, 1979). In the first Division 17 Counseling and Guidance doctoral training report it was asserted that:

> On counseling psychologists falls the chief responsibility for conducting the research upon which depends the possibility of more effective counseling. Any field needs roots in the basic scientific discipline which lends substance to its work. It is therefore imperative that psychological counseling remain firmly established within the orbit of basic psychological science and the related disciplines, and that counseling psychologists acquire the research skills which make possible the enlargement of knowledge (American Psychological Association, 1952, p. 176).

According to this statement, psychologists within the field of counseling psychology have long attested to the importance of having a scientific foundation underlying the practices employed by counselors.

To promote scholarly work alongside training in clinical practice, the majority of clinical and counseling psychology doctoral programs have adhered to the scientist-practitioner model (also known as the Boulder Model). This model was developed and

adopted at the Boulder Conference on Graduate Education in Clinical Psychology in 1949 (McFall, 2006; Shapiro, 2002), and emphasizes that the core of psychologists' vocational identity should include the development of both scientific-mindedness and the skills of clinical practice (see Barlow, Hayes, & Nelson, 1984 for an overview of the model). Gelso and Fretz (1992) proposed that successful scientist-practitioner training programs are those that teach their students to produce scholarly work, critically evaluate scholarly work, and apply what they have learned of the scientific method to their interpretations of diagnoses, treatment planning, and treatment effectiveness. The major tenets of the scientist-practitioner model, when met, not only prepare students for possible careers in academia, but also prepare them to competently implement evidence-based practices in their clinical, consultative, or supervisory work. By emphasizing the importance of training students to be able to conduct and interpret research, the field can continue to maintain its identity as a science by contributing to society, as well as better serve the needs of individuals who seek the professional services of psychologists.

Lack of Research Interest/Productivity

Despite the scientist-practitioner model's emphasis on engaging in scientific activity, the vast majority of clinical and counseling psychology doctoral students report low levels of research interest while in graduate school and indicate little or no intention to pursue postdoctoral research (Cassin, Singer, Dobson, & Altmaier, 2007; Fitzgerald & Osipow, 1988; Parker & Detterman, 1988). In a recent study of clinical and counseling psychology doctoral students' career interests, less than 15% of those surveyed from both fields identified research as one of their occupational goals (Cassin et. al.). Given their reported lack of interest, most clinical and counseling psychology doctoral students

produce very few, if any, scholarly works during their graduate training and subsequently do not engage in scholarly activities following completion of their dissertation (Brems, Johnson, & Gallucci, 1996; Cobb et al., 2004; Cooper & Turpin, 2007; McFall, 2006). Brems et al. compared research productivity between clinical and counseling psychologists and found no significant difference between the two groups' numbers of published manuscripts. They noted that an alarmingly small percentage of clinical and counseling psychologists were involved in scholarly projects. Of their combined sample of clinical and counseling psychologists, only 30% contributed to book publications and fewer than 30% to journal publications. These findings suggest that of all professional psychologists, less than half are responsible for all of the research being conducted within the field. In an effort to explore the nature and quality of the articles being published, Karr and Larson (2005) reviewed the theories, hypotheses, and statistical analyses employed in articles within three major counseling psychology journals (*Journal of Counseling Psychology, Journal of Vocational Behavior,* and *Journal of Counseling and Development*). They found that less than half of the published articles contained research that was based on theory. Furthermore, of the articles that identified coherent theories behind their hypotheses, 77% discussed theories that were never re-examined within the subsequent ten-year period. These findings glaringly indicate pervasively limited research activity among psychologists, and have produced growing concern among those who believe that scholarly activity is the vehicle which catalyzes the expansion of the field (Gelso, 1979; Stricker, 1997).

Some have reasoned that the scientist-practitioner paradigm should not be the only model for teaching applied psychology doctoral students and that there should be an

alternative for people who are less interested in conducting research (Cobb et al., 2004; McFall, 2006). It was suggested that creating a new type of program might provide increased space within scientist-practitioner programs for those who possess an interest in both clinical practice and conducting research. In an effort to provide aspiring psychologists with a different option in which they could receive doctoral- level training in a less research-intensive environment, many programs have now adopted the "practitioner-scholar" model (also known as the Vail Model). In this model, students earn the degree of Doctor of Psychology (Psy.D.) rather than Doctor of Philosophy (Ph.D.). The practitioner-scholar model aims to differentiate itself from the scientist-practitioner model in several ways. While both models emphasize the importance of using research to inform clinical practice, programs subscribing to the practitioner-scholar model tend to differ in their approach to teaching their students research topics, methods, and goals (McFall; Stoltenberg et al., 2000). Because practitioner-scholar programs focus more heavily on clinical practice, the research generated by individuals in these programs typically addresses questions that are directly related to concerns within applied clinical settings. As such, Psy.D. students' doctoral dissertations may be more likely to obtain smaller sample sizes and implement qualitative, rather than quantitative, research designs.

The practitioner-scholar model also differs from the scientist-practitioner model in that its goal is to produce superior practitioners rather than psychologists with equal training in research and clinical practice (McFall, 2006). Psy.D. students typically spend less time learning about research so that they may gain more extensive training in applied settings. The opportunity for prospective psychology doctoral students to choose between pursuing a Psy.D. or Ph.D. was expected to strengthen the field by allowing individuals

who are predominantly interested in clinical practice to receive maximum training as practitioners and freeing up spaces for students genuinely interested in both science and practice. However, despite the emergence of Psy.D. programs, measures of scholarly productivity and research interest among clinical psychology Ph.D. and counseling psychology Ph.D. students have not changed in recent years (Kahn & Schlosser, 2010). The finding that Psy.D. students have been indicated to be less active in research and less interested in pursuing academic careers than Ph.D. students (Cassin et al., 2007) suggests that the proliferation of practitioner-scholar training programs has not had the desired effect on scholarly activity in the field.

In an effort to increase research involvement among students and practicing psychologists, researchers have proposed various contextual and individual factors that may affect students' desire to participate in scholarly activity. Perhaps because of greater availability to researchers, studies in this area have typically used counseling psychology doctoral students, rather than clinical psychology doctoral students, as participants. Research on this topic has identified environmental conditions within the research training environment (RTE; Gelso, 1979), social-cognitive variables such as self-efficacy beliefs and research outcome expectations (e.g., Gelso, Mallinckrodt, & Judge, 1996), and personality characteristics (e.g., Kahn & Scott, 1997) as important factors related to research interest. These variables have been incorporated into an overarching model of research interest using Lent, Brown, & Hackett's (1994) social-cognitive career theory (SCCT). Lent et al. proposed a theoretical framework based on Bandura's (1986) social-cognitive theory to describe how people develop academic interests, select careers, and perform in vocational settings. They posited that interest is directly influenced by

individuals' self-efficacy and outcome expectations, and that these variables are mediated by personality characteristics and environmental factors. Researchers who have tested the application of this theory as it pertains to research interest have produced mixed results. For example, Bieschke, Bishop, and Herbert (1995) found that outcome expectations accounted for over 40% of the variation in research interest whereas self-efficacy explained only 3%. More recently, Kahn (2001) explored SCCT variables in relationship to both research interest and scholarly activity of counseling psychology doctoral students. Outcome expectations, but not self-efficacy, were significantly related to research interest. Regarding research productivity, Kahn found that a combination of self-efficacy, outcome expectations, and research interest accounted for only 17% of the variance in actual research-related activities. In sum, the literature regarding research interest suggests that scholars have not yet reached a consensus regarding the primary variables that are contributing to clinical and counseling doctoral students' minimal participation in scholarly pursuits.

Given that previous theories examining research interest have not been fully supported, a further investigation of this topic is warranted. Some scholars have argued that motivational variables may be a valuable area of study regarding doctoral students' research interests (Deemer, Martens, & Buboltz, 2010; Deemer, Martens, & Podchaski, 2007; Gelso & Lent, 2000; Hill, 1997). Deemer, Martens, and Buboltz proposed a tripartite model of research motivation that integrates intrinsic and extrinsic motivation from self-determination theory (Deci & Ryan, 1985, 2000a) and approach and avoidance motivation from classic achievement motivation theory (Atkinson, 1957; Elliot, 1997) to further investigate the factors that propel students toward research.

Achievement Motivation/Fear of Failure

Fear of failure has been proposed as an underlying motivating factor that may help explain students' apparent lack of research interest (Deemer et al., 2007). Cassin et al. (2007) found that doctoral students who reportedly did not want to work in academia most frequently cited publication pressure, difficulty attaining tenure, heavy work demands, and competition as their reasons for not pursuing an academic career. The results of this study indicate that students might avoid research because of the risks involved rather than dislike for conducting research. One theory that addresses students' fear of failing is achievement motivation theory (Atkinson, 1957; Elliot, 1997; McClelland, Atkinson, Clark, & Lowell, 1953). Unlike many theories of human motivation that perceive behavior as a function of *how much* motivation exists, achievement motivation theory posits that behavior varies by the *type* of motivation that is associated with a given activity (Elliot, 1997).

McClelland and colleagues posited that fear of failure is a dispositional tendency that motivates individuals to act with the intent to avoid failure. Elliot and Church (1997) later proposed that achievement motivation is governed by a hierarchical model in which goal pursuits are indirectly influenced by dispositional motives, namely approach and avoidance. Approach motivation has been defined as the energization of behavior toward positive expectancies while avoidance motivation refers to the direction of behavior away from negative possibilities (Elliot, 2006). Fear of failure is viewed as the primary affective disposition underlying the avoidance orientation (Birney, Burdick, & Teevan, 1969). Because researchers cannot guarantee that every study they conduct will

successfully support their hypotheses, it stands to reason that professional psychologists who fear failure may be less inclined to engage in research in their careers.

Self-Determination Theory

Like achievement motivation, self-determination theory (SDT) is another approach to motivation which asserts that the type of motivation present is more relevant than the amount of motivation when trying to predict behavior (Deci & Ryan, 2008). One way in which SDT researchers have explored the effects of motivational type on learning and behavior is through their work on intrinsic and extrinsic motivation (Deci & Ryan, 1985, 2000a). When motivation is intrinsic, individuals are energized by the satisfaction they receive from a given activity that is independent from external pressures or rewards. Extrinsic motivation, on the other hand, involves behavior that is not autonomously driven (Deci & Ryan, 2008). SDT posits that intrinsic and extrinsic motivation are not mutually exclusive, but instead exist upon a continuum that is defined by the degree to which individuals perceive their behaviors as being self-regulated.

Purpose of This Study

Earlier studies examining the factors affecting research interest have focused predominantly on contextual and individual factors, but little attention has been paid to the dispositional motives or underlying psychological needs that may influence individuals' desire to conduct research. Recently, however, Deemer, Martens, and Buboltz (2010) proposed a tripartite model of motivation using factors from SDT and approach-avoidance theory to explore underlying motivational dispositions that may contribute to doctoral students' research interest and productivity. Their measure, the

Research Motivation Scale (RMS) includes three scales: Failure Avoidance (FA), Intrinsic reward (IR), and Extrinsic Reward (ER).

The first two studies using the RMS suggest that it may be an effective tool for studying research motivation (Deemer, Martens, & Buboltz, 2010; Deemer, Mahoney, and Hebert Ball, in press). This study aimed to replicate the reliability and factor structure of the RMS in a sample of counseling and clinical psychology doctoral students. It was expected that the present study would provide further evidence of the validity and reliability of the RMS. Because this measure was developed primarily using a sample of graduate students within the physical sciences and had not yet been administered to a sample of clinical psychology doctoral students, another goal of this study was to examine the construct validity of the scale in a behavioral sciences population. Finally, this study investigated the predictive utility of the RMS as it relates to research interest. Understanding the variables that predict doctoral students' desire to continue pursuing research beyond the attainment of their degree may help training programs improve their methods of training students who are both scientists and practitioners. Given that most doctoral counseling and clinical psychology students do not participate in research beyond the completion of their degree, the present study may prove helpful in developing a solution for this growing issue.

Literature Review

Some researchers who have investigated the factors affecting research interest in counseling psychology doctoral students have proposed that student motivation may be a variable worth examining (Gelso & Lent, 2000; Hill, 1997). Motivation is a critically important area of study because it offers explanations for what energizes people to act.

When examining motivation, researchers are able to draw connections between individuals' motivation and the consequences of this force. Decades of research concerning the processes which underlie motivation has provided a wealth of information about the conditions under which individuals perform at their most optimal level of functioning (Deci & Ryan, 1985, 2000b, 2008). The central focus of many theories of motivation involves the question of how much motivation is required to initiate behavior (Deci & Ryan, 2008). These types of theories describe motivation as a unitary construct and assume that the more motivated a person is, the more successful he or she will be. Although the quantity of motivation is relevant to predicting behavior in some instances, some motivation theorists have proposed that there are different types of motivation, some of which are more successful than others at catalyzing behavior (Deci & Ryan, 2008). Therefore, the quantity of motivation may not be as important as the quality. Deemer, Martens, and Buboltz (2010) have posited that certain types of motivation, namely intrinsic, extrinsic, and avoidance motivation, may contribute to the variance among doctoral students' research interest. Early theories of motivation – as well as SDT and approach-avoidance theory, the central theories of Deemer, Martens, and Buboltz's model – are discussed in the following sections.

Historical Perspectives on Motivation

During the first half of the 20th century the dominating theories on motivation subscribed to a mechanistic perspective which assumed that most human behavior is motivated by physiological drives, namely hunger, thirst, sex, and avoidance of pain (Elliot & Dweck, 2005). Drive theorists predicted that individuals whose basic physiological needs had been met would act passively in their environment. Drive

theories are those that describe motivation as a unitary construct, and predict behavior based on the quantity of motivation that is present. This school of thought consisted largely of two approaches, empirical and psychoanalytic (Elliot & Dweck). One highly prominent theory of motivation within the psychoanalytic approach during this time period was Freud's theory (1915/1925) of psychosexual development. Freud asserted that the motivation behind all behaviors could be reduced to two basic drives: sex and aggression. He proposed that objects in the environment become associated with these basic instincts, and in turn influence how people behave. Freud focused much of his theory on the sexual instinct and posited that, as children, individuals learn how to manage this drive through a series of psychosexual stages. He described various neuroses that could result from unresolved conflicts involving the sexual instinct during these critical years. Researchers exploring the utility of this theory found that it provided one possible way of accounting for psychological disturbances, but did not offer a way of understanding normal human development and motivation (e.g., Hartmann, 1939/1958). Also, Freud's theory of the psychosexual stages proved difficult to study, given that much of what he postulated could not be directly tested.

In response to theories like Freud's, which were difficult to test experimentally, a highly empirical approach to understanding human behavior emerged from the work of John B. Watson (1913) that would later influence many others. Watson called attention to his belief that, as highly subjective perspectives gained prominence in the field, psychology was losing its foothold as a science. He encouraged psychologists to focus on behavior rather than internal states when trying to understand animals and humans. Watson proposed that all organisms are a product of their genetics and the forming of

habits in response to their environments. He asserted that in addition to heredity, observable behavior is a series of responses that have become learned through repeated presentations of stimuli. According to Watson, behavior that is rewarded by the presentation of desirable stimuli is repeated, whereas unrewarded behavior is not repeated. Aptly termed behaviorism, Watson's theory spawned a new school of thinking about how to study humans, and his influence is evident in theories of motivation that emerged during the mid-1900s.

A prominent drive-based theory of motivation during the mid-1900s that was largely influenced by Watson was proposed by Hull (1943), who stated that physiological needs, namely food, water, sex, and the avoidance of pain, emerge out of deficits within the nervous system and propel organisms to act in ways that fulfill these needs and maintain health. Hull believed that when people experienced a physiological need, they would be driven to reduce the need, and that the experience of having satisfied this physiological deficit would subsequently lead to paired-associative learning. According to Hull, behavior could be predicted by understanding how organisms associate stimuli with the reduction of their physiological needs.

While this theory could sufficiently explain many forms of observable behavior, several studies found that Hull's theory of physiological drives could not be applied to some behaviors observed in animals, such as curiosity and play. For example, Dashiel (1925) found that starving rats were willing to forego food, and Nissen (1930) observed that rats would voluntarily move toward electric shock, in order to explore novel territory. These results were contradictory to what Hull's theory predicted, which is that starving

rats would be primarily motivated to obtain food. Instead, these animals demonstrated that they were motivated by something other than hunger.

Additionally, drive theory provided no explanation for the curiosity, investigatory manipulation, and play behaviors observed in humans (Deci & Ryan, 2000a, 2000b). In his research on focal attention, Schachtel (1954) observed that infants would follow moving objects with their eyes and later show interest in manipulating objects in the environment. Schachtel noted that curiosity about the environment was more prevalent under conditions of low anxiety in which all of the infant's needs had been met. These behaviors did not seem easily explained in terms of physiological drive reduction or by Freud's sexual and aggressive instincts.

Woodworth (1958) remarked on similar findings that he observed in children. Complex play, such as building with blocks, or social interactions between children did not seem to fulfill a specific deficit, as the outcomes of these events are never guaranteed. When children play together they do not consistently offer companionship, rather they provide an opportunity to experience something new within their environment. Woodworth theorized that, while basic physiological drives exist, there are other processes that energize people to act. The work of researchers like Woodworth and Schachtel were in sharp contrast to the underlying tenets of drive-based theories because they revealed that humans' behavior was more complex than drive-based theories could explain. Animal researchers provided similar results, and demonstrated that, in some cases, animals could be motivated to ignore their basic physiological needs in exchange for novelty and exploration.

B. F. Skinner (1938) expanded upon earlier behaviorist theories that had difficulty accounting for behaviors that did not seem directly linked to a stimulus. He acknowledged that behavior could not always be predicted by identifying a stimulus preceding an eliciting response. He proposed that behaviors such as painting a picture or singing a song were still a consequence of some unobserved stimulus, but that other factors such as the sequence of events and amount of stimulus-response pairings need also be considered. For example, behavior could be elicited by the expectation of a future reinforcer that need not immediately present itself following the behavior. In situations in which there was no tangible reinforcer, Skinner concluded that the act of receiving any feedback from the environment might in and of itself be rewarding, and thus would increase the likelihood of the behavior being repeated. For example, babies might become motivated to play with a noisy toy simply because they are reinforced by the act of making noise. Skinner's theory was one attempt to describe behavior that was being observed, but it did not account for why people might find interactions with the environment that hold no physiological value so rewarding. These unanswered questions required psychologists to return to an examination of the internal processes that propel humans to act, namely the psychological needs that motivate behavior.

Another perspective of motivation to emerge within this time period addressed psychological, rather than physiological, needs (Murray, 1938). Henry Murray, a Harvard psychologist, broadly defined his concept of psychological needs as learned rather than innate. He stated that:

> A need is a construct (a convenient fiction or hypothetical concept) that stands for a force (the physic-chemical nature of which is unknown) in the brain region, a

> force that organizes perception, apperception, intellection, conation, and action in such a way as to transform in a certain direction an existing, unsatisfying situation (pp.123-124).

According to Murray's definition, nearly any psychologically based desire that comes from a drive to quench an unsatisfied goal could be considered a need. In his theory, Murray termed these needs "psychogenic needs" and identified twenty-four different types, such as need for achievement, power, and affiliation. In addition to being one of the first to address psychological needs, Murray also offered a way of looking at motivation in terms of varying types rather than as quantity of motivation.

Many of Murray's (1938) proposed needs have generated a wealth of research. Need for achievement, for example, influenced the work of David McClelland and his colleagues (1953) and will be discussed later in this chapter. Murray contended that environmental forces he called "press" played a considerable role in how individuals develop psychogenic needs. His theory of psychogenic needs was influential because it drew researchers' attention toward a new way of thinking about how behavior can be driven. Unlike Freud's (1915/1925) or Hull's (1943) views that human behavior could be reduced to a series of physiological drives, Murray proposed that people could be motivated by psychological needs as well. While his theory was highly influential, it lacked several components of how researchers view psychological needs today (Deci & Ryan, 2000a). For example, his theory focused solely on the acquisition of needs, including the notion that psychologically based needs may be innate. Similar to the proponents of drive-based theories, Murray's theory did not account for the curious, exploratory behaviors observed in both animals and humans. Additionally, his theory

conceptualized psychological needs as emerging from a lack of something in the environment rather than a consequence of healthy development.

Early drive theories paved the way for organismic motivational theories which assume that organisms are motivated by innate psychological needs in addition to physiological drives. To account for behaviors like play and exploration, White (1959) proposed the concept of *effectance motivation*. He asserted that individuals are innately motivated to attain mastery of their environment. The feeling of competence that results from successful interactions with the environment produces positive feelings of self-efficacy which in turn reward and facilitate more competence-related behaviors. White's theory was the first attempt to explain behavior as resulting from an innate psychological need. One important difference between White's theories and earlier theories of motivation is that his was the first to conceptualize a type of motivation that did not derive from some internal deficit. Rather, White's view of effectance motivation was that it was innate and a normal part of healthy development. Although White did not originally use the term intrinsic motivation, his concept of effectance motivation is synonymous with intrinsic motivation as it has been described by others (e.g., Deci, 1975). Intrinsic motivation has become an important topic, particularly as it pertains to learning. For decades, self-determination theorists Edward Deci and Richard Ryan have conducted research on the effects of intrinsic and extrinsic motivation (1985, 2000a). SDT has proven useful in explaining the variation in students' learning strategies, performance, and persistence (Vansteenkiste, Lens, & Deci, 2006).

Self-Determination Theory

SDT proposes that humans are active beings who inherently gravitate toward experiences that will promote their psychological health and well-being, namely by challenging themselves, engaging in interesting and novel activities, and pursuing relationships with others (Deci & Ryan, 2008). However, these innate tendencies require ongoing support and as such, are facilitated or hindered by the social environment. According to SDT, optimal support is that which serves to promote humans' three fundamental needs: competence, autonomy, and relatedness (Deci & Ryan, 2000a, 2000b). Competence refers to a sense of effectiveness and confidence in one's abilities and is very similar to Bandura's (1977, 1997) concept of self-efficacy. Autonomy refers to an individual's ability to initiate and maintain behavior (Deci, Vallerand, Pelletier, & Ryan, 1991). The behavior of autonomous individuals is governed by their own beliefs and is not perceived to be controlled by external sources. Relatedness involves forming secure and rewarding social networks with one's peers.

Intrinsic Motivation

Consistent with SDT's organismic perspective, SDT proposes that not all behavior is governed by psychological and physiological drives. In environments that satisfy humans' basic needs for autonomy, relatedness, and competence, individuals will naturally behave in ways that gratify their curiosity and desire to challenge themselves (Deci & Ryan, 2000a). Behavior that is energized solely for the purpose of satisfying individuals' internal desires to do so is said to be intrinsically motivated. SDT defines intrinsic motivation as the "inherent tendency to seek out novelty and challenges, to extend and exercise one's capacities, to explore, and to learn" (Deci & Ryan, 2000b, p.

70). It is considered to be an essential part of healthy cognitive and social development and a central component of well-being and optimal functioning.

Extrinsic Motivation

Although SDT suggests that intrinsic motivation is the optimal form of motivation, it also recognizes that many activities that people perform in their daily lives are not self-regulated (Deci & Ryan, 2000a). This becomes particularly evident in adulthood when individuals gradually take on more socially demanding roles that require them to engage in uninteresting, albeit necessary responsibilities. For example, paying bills or cleaning one's home are not likely to be inherently interesting activities, but they are often essential tasks in maintaining one's quality of life. According to Deci and Ryan (2000a), when behavior is driven by external sources such as rewards or social pressures it is considered to be extrinsically motivated. Extrinsic motivation has typically been painted as a less favorable type of motivation than intrinsic motivation, and has been linked to a host of less desirable learning outcomes, such as decreased inherent interest in a given activity and decreased task persistence (e.g., Kasser & Ryan, 1996). However, proponents of SDT suggest that there are varied types of extrinsic motivation, some of which represent suboptimal forms of motivation and others which are linked to positive outcomes.

Types of extrinsic motivation are distinguished by the degree to which individuals perceive their behavior as autonomous and interpret societal values or requests as their own (Deci & Ryan, 2008). Deci and Ryan (2000a, 2008) refer to this process as internalization. SDT proposes a dimensional model that defines types of extrinsic motivation by the degree to which external values or ideals are internalized. Within this

model exists four types of extrinsic motivation: (a) external regulation, (b) introjection, (c) identification, and (d) integration (Deci & Ryan, 2000a). At opposing ends of this spectrum lie amotivation and intrinsic motivation. Amotivation refers to a state characterized by the absence of willful intent. Amotivation is likely to occur when individuals do not value the given activity (Ryan, 1995), do not feel competent to complete the task (Deci, 1975), or do not believe that the action will yield a desired outcome (Seligman, 1975). Amotivation often results in a lack of behavior. External regulation is regarded as the classic type of extrinsic motivation in which individuals' behavior is dependent on rewards or the avoidance of a given task and thus, will predict poor maintenance of goal-directed behavior once the desired consequences are removed (Deci & Ryan, 1985). For example, students who complete assignments only to receive a reward, and do not derive any enjoyment from completion of the task, are exhibiting external regulation. Introjection refers to behaviors which are internally driven, but are not perceived to be compelled by one's own goals.

Introjection occurs when behavior is motivated by a desire to avoid negative feelings such as guilt, shame, and anxiety or to seek approval from others (Deci & Ryan, 2000a). Individuals who exhibit introjections still do not inherently enjoy the tasks that they are performing, but they perform them nonetheless in order to avoid negative consequences.

In identification, individuals have accepted the value of engaging in a behavior, but have done so in order to attain a positive outcome from their environment (Deci & Ryan, 2000b, 2008). For example, smokers who choose to quit for the sake of their health are doing so of their own volition but are still seeking a reward (better health) in the

process. Finally, integration refers to the most mature form of extrinsic motivation, in which external values or requests have been totally accepted and incorporated into one's own identity (Deci & Ryan, 2000b, 2008). Integration, while very similar to intrinsic motivation, is still considered to be an extrinsic form of motivation because it represents a value that developed over time rather than an inherent interest. A student who originally did not enjoy conducting research but developed an internal desire to engage in scholarly productivity after receiving training in graduate school would be considered to be exhibiting integration. Refer to Figure 1 for a visual depiction of the SDT continuum.

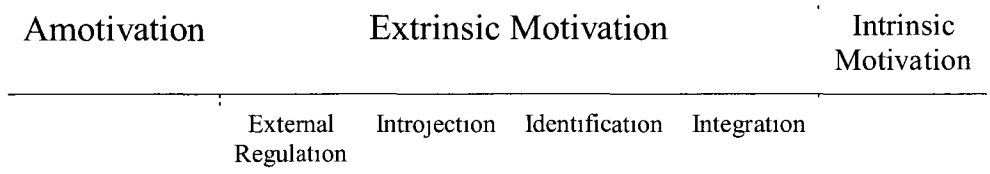

Figure 1. SDT Continuum. Adapted from "The 'what' and 'why' of goal pursuits: Human needs and the self-determination of behavior," by E. L. Deci and R. M. Ryan, 2000a, *Psychological Inquiry*, p. 237. Copyright 2000 by Lawrence Erlbaum Associates, Inc.

In a first attempt to test Deci and Ryan's (1985) hypothesized dimensional model of extrinsic motivation, Ryan and Connell (1989) used a sample of elementary school students and assessed their intrinsic, external, introjected, identified, and integrated reasons for engaging in various achievement behaviors (e.g., doing homework). They found that the correlations between these proposed types of motivation were consistent with their theorized positions on the continuum. More recent studies have yielded consistent support for Deci and Ryan's formulation of intrinsic motivation, external regulation, and introjection as distinct forms of motivation existing on a continuum relative to autonomy, but researchers have had limited success in demonstrating

integration and identification to be unique constructs (Cokley, Bernard, Cunningham, & Motoike, 2001; Fairchild, Horst, Finney, & Barron, 2005). In response to these findings, some have suggested that the motivational types described by SDT may not actually be mutually exclusive constructs existing on different points of a motivational spectrum (e.g., Lepper & Henderlong, 2000). Rather, types of motivation that share properties of intrinsic and extrinsic motivation, such as integration and identification, may not be distinct enough constructs to possess substantial predictive utility on their own.

Outcomes of Intrinsic and Extrinsic Motivation

Numerous studies have demonstrated a link between self-determined types of motivation and various educational outcomes across the age span, from early elementary school to college and into employment. Autonomous behavior has been found to be positively related to higher achievement (Fortier, Vallerand, & Guay, 1995; Soenens & Vansteenkiste, 2005), perceived competence (Deci & Black, 2000; Fortier et al.), greater persistence in college courses (Deci & Black; Vallerand & Bissonnette, 1992), deeper information processing (Vansteenkiste, Simons, Lens, Sheldon, & Deci, 2004), and greater conceptual learning (Grolnick & Ryan, 1987). Additionally, longitudinal studies exploring the relationship between intrinsic motivation and academic achievement suggest that these positive outcomes persist over time (e.g., Guay & Vallerand, 1997). Gottfried, Fleming, and Gottfried's (2001) longitudinal study also indicated that children's intrinsic motivation toward academics remained stable between the middle school and high school years.

Self-determined forms of motivation have been linked to positive career outcomes including greater job satisfaction, feelings of professional efficacy, and less work burnout

(Fernet, Guay, & Senecal, 2004; Judge, Bono, Erez, & Locke, 2005). Judge et al. conducted a longitudinal study in a sample of college students and employees to investigate overall job and life satisfaction. They found that individuals who held high amounts of self-regard reported greater intrinsic motivation toward their academic pursuits or careers and also reported the greatest overall satisfaction. Intrinsic motivation has also been found to be associated with career decision-making outcomes. For example, Guay, Sencal, Gauthier, and Fernet (2003) proposed a motivational model of career-decision making using the principles of SDT. According to their model, individuals who experience greater difficulty in choosing a vocation report feeling less autonomous in their decision making than do their self-determined counterparts. Research has supported their hypothesis that individuals make decisions about careers more easily when they feel free to pursue their interests (Guay, 2005; Guay et al., 2006).

Facilitating vs. Undermining Intrinsic Motivation

Given the overwhelming body of literature attesting to the relationship between intrinsic motivation and positive educational outcomes, researchers have sought to explore the conditions in which the construct can be facilitated or undermined. One subtheory of SDT, Cognitive Evaluation Theory (CET; Deci & Ryan, 1985), uses the principles of SDT to examine the factors that facilitate or thwart individuals' intrinsic motivation. According to CET, intrinsic motivation is undermined when individuals' basic needs for competence, autonomy, and relatedness are not met. In the 1970s, a series of experimental studies examining the effects of positive feedback found a positive correlation between verbal rewards and intrinsic motivation (e.g., Deci, 1971). In response to these findings, Deci & Ryan (1980) suggested that positive feedback

effectively facilitates intrinsic motivation by supporting individuals' need for competence. This became one of the basic tenets of CET – that any conditions which promote feelings of competence, such as positive feedback or the provision of challenging (albeit attainable) experiences, enhance intrinsic motivation by satisfying the basic psychological need for competence whereas events that decrease competence, such as negative evaluations, thwart intrinsic motivation (Deci & Ryan, 1985, 1999; Ryan & Deci, 2000).

Later research, however, suggested that promoting competence is only an effective mechanism of facilitating intrinsic motivation if individuals simultaneously feel autonomous in pursuing their goals (Ryan, 1982, Fisher, 1978). In one study using the free choice paradigm (Ryan, 1982), in which intrinsic motivation is inferred by whether participants opt to perform a task after they are no longer obligated to do so, college students were given informational ("Good job") or controlling (e.g., "Good, you did just as you should on that one") forms of positive feedback during the time that they were required to complete a given task. Results indicated that students who received the controlling feedback demonstrated less interest in engaging in the task on their own than those who received the informational feedback.

The majority of research examining the factors affecting intrinsic motivation has focused on autonomy rather than competence. Proponents of SDT claim that offering extrinsic rewards leads individuals to perceive their behavior as being more externally driven, thus undermining intrinsic motivation through the diminishment of their autonomy (Deci & Ryan, 2000a, 2000b). Autonomy is believed to be thwarted by external rewards when people are not provided with a rationale for completing a given task, not given a choice about how to complete the task, or not given the opportunity to express

their feelings about a particular task. Although many scholars have argued against this assertion, a meta analysis indicated that nearly every type of extrinsic reward negatively affects intrinsic motivation (Deci & Ryan, 1999). Other controlling forces that have been found to threaten individuals' perceptions of internal locus of causality, and thus undermine intrinsic reward, are deadlines (Amabile, Dejong, & Lepper, 1976; Burgess, Enzle, & Schmaltz, 2004), directives (Koestner, Ryan, Bernieri, & Holt, 1984; Gagne, Koestner, & Zuckerman, 2000), and competition (Ryan & Deci, 1996).

Although most research on intrinsic motivation has focused on how it is affected by feelings of competence and autonomy, studies have also shown that relatedness plays a role in the facilitation of intrinsic motivation (Deci & Ryan, 2000a). Unlike autonomy and competence, relatedness is viewed as a distal contributor to intrinsic motivation in that it provides individuals with a secure base in which to develop their autonomy and competence. Several studies have demonstrated that having close relationships with others is positively related to intrinsic motivation. Ryan, Stiller, and Lynch (1994) and Ryan and Grolnick (1986) found that elementary school students exhibited greater intrinsic motivation toward academic performance when they perceived their teachers to be warm and supportive. In a more recent study, students were rated on their perceptions of teacher support, motivation toward homework, and attitudes about school as they transitioned from elementary school to junior high school (Katz, Kaplan, & Gueta, 2010). Katz et al. found that perceived support contributed significantly to how autonomous the students felt in completing assignments in their new school. In one study investigating factors that may facilitate integration and internalization in regard to valuing academic coursework, Kaufman and Dodge (2009) found that college students assigned greater

value to their introductory psychology course when they felt a sense of relatedness to their professors. A linear regression analysis indicated that feelings of autonomy were predictive of relatedness. These findings are consistent with the tenets of CET, which contend that relatedness has an important mediating relationship to positive academic outcomes.

Despite the great deal of research attesting to the negative effects of extrinsic motivation, considerable controversy exists as to whether extrinsic motivation undermines intrinsic motivation in all circumstances. Weichman and Gurland (2009) tested the effects of offering a monetary incentive to college students using a shortened version of the free choice paradigm. Although the control and experimental groups did not differ in the degree to which they reportedly enjoyed the task, a polarizing effect was observed in that rewards undermined intrinsic motivation for some in the experimental group but enhanced intrinsic motivation for others. Weichman and Gurland hypothesized that underlying individual differences may have mediated the effect of the extrinsic reward. Meta analytic results have emerged in support of opposing sides in the debate over the effects of extrinsic rewards. Some researchers insist that they are detrimental (Deci, Koestner, & Ryan, 1999), whereas others maintain that extrinsic rewards do not affect intrinsic motivation and can even increase it under certain circumstances (Cameron, Banko, & Pierce, 2001; Cameron & Pierce, 1994; Covington, 2000). In their most recent meta analytic review, Cameron et al. (2001) asserted that external rewards increase interest for both low- and high-interest types of tasks. The use of verbal rewards was noted as one form of external reward that produced positive effects on self-reported interest in assigned tasks.

Regarding academic settings, Covington (1999) proposed that students who are reportedly motivated by attaining good grades also endorse genuine interest in their course work depending on what is driving their motivation for receiving high grades. His results indicated that only when students seek grades for the purpose of avoiding failure is their intrinsic motivation undermined by external rewards. Covington and Mueller (2001) suggested that intrinsic motivation could be undermined by external rewards when competition in the classroom invoked a fear of failure in the students. They proposed that classroom situations in which rewards are limited and consistently given to the same handful of students can lead to feelings of unworthiness in those who do not receive rewards. These negative feelings in turn lead to a type of extrinsic motivation in which the students are simply acting to avoid further negative feelings rather than out of satisfaction in completing the task. Alternatively, they suggested that conditions in which all students have the opportunity to be rewarded (e.g., all students with a B average or better will make their school's honor roll or Dean's list) for their accomplishments will not undermine intrinsic motivation.

Recently, researchers examined the role of competence, autonomy, and relatedness and their relationship with students' perceptions of their college courses and professors (Filak & Sheldon, 2003). In a sample of two different groups of undergraduate students, those who indicated decreased satisfaction of their needs for competence, autonomy, and relatedness reported decreased overall enjoyment in their classes and more negative perceptions of their professors. This study lends further support to SDT's premise that these underlying needs, when met, can facilitate inherent enjoyment of activities; when unmet, inherent enjoyment of activities is undermined.

Given the inconsistencies in the literature, some have proposed that intrinsic and extrinsic motivation need not be conceptualized as incompatible with one another (e.g., Harackiewicz, Barron, & Elliot, 1998; Pintrich, 2000). Instead, individuals may have multiple goals motivating them to complete a task. In one study, Lin, McKeachie, and Kim (2001) administered measures of intrinsic and extrinsic motivation to college undergraduates and compiled their scores into categories of low, medium, and high. They found that participants with a high amount of intrinsic motivation and a moderate amount of extrinsic motivation produced the highest average of final course grades. They concluded that optimal achievement may occur when individuals are both intrinsically and extrinsically motivated. These results may help to explain the inconsistencies in the literature.

Proponents of SDT have suggested that extrinsic motivation exists on a continuum that is anchored by amotivation on one end and intrinsic motivation on the other end (Ryan & Deci, 2000). Where individuals' motivation falls on this scale is determined by the degree to which they perceive their goal pursuit as autonomous or controlled. Because research strongly suggests that intrinsic motivation is a valuable predictor of interest, task performance, and persistence over time, it is reasonable to assume that it may be similarly related to research interest. To date, no studies have examined the predictive utility of intrinsic motivation and forms of extrinsic motivation regarding research interest.

Fear of Failure: Historical Perspectives

As was previously discussed, there are environmental factors that contribute to the type of motivation which students apply to their academic pursuits. The quality of this

motivation, intrinsic or extrinsic, is likely to influence how successful they are at achieving their goals. While intrinsic and extrinsic motivation are powerful predictors of students' academic goals, there are also underlying dispositional factors that contribute to how and why they pursue these tasks, such as fear of failure.

Fear of failure is a widely studied construct that first gained attention in the 1930s. Murray (1938) provided an initial conceptualization of this construct after conducting research with male college students. He suggested that all individuals are to some degree motivated by a need for *infavoidance.* Murray's use of the term infavoidance refers to motivation that is driven by fear of failure. His seminal work inspired a great deal of interest in studying his *need for achievement* concept, but it wasn't until the 1950s that attention was turned toward fear of failure.

Termed the "classic approach" (Elliot, 1997) to studying achievement motivation, researchers David McClelland, John Atkinson, Russell Clark, and Edgar Lowell (1953) proposed that need for achievement and fear of failure are motivational dispositions which represent the ways in which individuals are moved to act. Need for achievement describes a tendency for people to experience positive affect toward situations which they perceive to be challenging (McClelland et al.). Individuals with a high need for achievement are thus motivated by the anticipated feelings of triumph associated with overcoming a difficult task. Individuals with a tendency toward fear of failure, however, experience negative feelings in achievement situations that they believe to be challenging. Threatened by the possibility of failure, these individuals will generally avoid such situations (Birney et al., 1969).

Hierarchical Model of Achievement Motivation

The fear of failure literature indicates that achievement motivation dispositions contribute to students' goals and performance, although not directly. Instead, they affect more proximal achievement factors such as intrinsic motivation (Elliot & Church, 1997; Elliot & Covington, 2001). Elliot and Church proposed a hierarchical model in which they detailed the relationship between achievement motives (need for achievement and fear of failure), achievement goals, and achievement outcomes. They posited that achievement motivation is governed by a hierarchical model in which goal pursuits are indirectly influenced by dispositional "approach" and "avoidance" motives. Approach motivation has been defined as the energization of behavior toward positive expectancies and represents the need for achievement construct proposed by McClelland and colleagues (1953). Avoidance motivation refers to the direction of behavior away from negative possibilities (Elliot, 2006). Fear of failure is viewed as the primary affective disposition underlying the avoidance orientation. Within this model, achievement motives are described as the antecedents of achievement goals. Achievement goals are categorized as mastery or performance goals. Mastery goals refer to the desire to engage in a task to attain greater competence whereas performance goals reflect a motivation to perform well in comparison to others (Elliot, 1994). Thus, achievement motives predict the adoption of achievement goals which in turn directly influence academic outcomes such as intrinsic motivation and performance.

Research suggests that approach and avoidance can be conceptualized as a dimension of personality (Elliot & Thrash, 2002). The approach temperament, as defined in terms of personality, refers to a neurobiological sensitivity toward receiving positive

stimuli, such as rewards, from the environment. Individuals with such a temperament are believed to persist in any behavior that will help them continue to receive positive reinforcers from their external world. Alternately, avoidance tempered individuals have a neurobiological sensitivity to negative stimuli, such as punishment. They tend to be more reactive to negative feedback (whether it is real or imagined) and will adopt a behavioral disposition toward such stimuli. Elliot and Thrash (2010) recently published a series of six studies to provide evidence for the approach and avoidance temperaments. The goal of these studies was to design a measure for investigating the approach and avoidant temperaments and to establish the approach and avoidance temperaments as unique constructs which are separate from previously existing traits within theories of personality. Results from these studies provided evidence to support the validity and internal consistency of the measures used to explore these constructs. Additionally, they found that the approach and avoidance temperaments were related to, but distinct from, other popular personality constructs, such as extraversion and introversion.

The approach and avoidance temperaments have been linked to other established traits and measures of well-being (e.g., Elliot & Thrash, 2002, 2010). Studies indicate that, as compared to the approach orientation, avoidance-tempered individuals display higher levels of neuroticism (Elliot & Thrash, 2002) and negative emotionality (Bartels, 2007), and lower self-esteem (Heimpel, Elliot, & Wood, 2006). Of particular relevance to the present research are the numerous studies that have linked the avoidance orientation with negative outcomes within the college student population (e.g., Elliot & Harackiewicz, 1996). For example, studies following the academic progress and subjective well-being of college undergraduates over the course of a semester have

demonstrated that decreased subjective well-being (e.g., self-esteem, locus of control, overall life satisfaction), dissatisfaction with academic progress, decreased intrinsic motivation, and lower grades were mediated by fear of failure and the adoption of avoidance goals (Elliot & Church, 1997; Elliot & Sheldon, 1997).

Achievement Goals and Intrinsic Motivation

Given its consistently strong association with optimal academic outcomes, achievement goal theorists have investigated how intrinsic motivation is influenced by the performance and mastery goal constructs. Previous research suggests that mastery goals are positively linked to intrinsic motivation while performance goals have been indicated to lead to negative effects on intrinsic motivation (e.g., Nicholls, 1989). Mastery goals are believed to facilitate intrinsic motivation by generating excitement, increasing task involvement, providing a challenge, and supporting the basic needs proposed by SDT (Heyman & Dweck, 1992). Performance goals, in turn, are believed to undermine intrinsic motivation by eliciting anxiety through evaluative pressure. Others have contended, however, that performance goals only undermine intrinsic motivation when they are accompanied by an avoidance orientation (Elliot & Harackiewicz, 1996). Elliot and Harackiewicz asserted that both performance-approach and mastery-approach goals are focused on attaining competence and taking on challenges which are likely to promote intrinsic motivation. Alternatively, individuals with performance-avoidance goals are focused on acting in a way that will prevent others from viewing them as incompetent. Given that their goal is then to avoid failure rather than to succeed, the intrinsic motivation of these individuals' will be undermined by the desire to invest in a task as minimally and in as risk-free of a way as possible. In a meta-analysis involving the

literature on achievement goals and intrinsic motivation, Elliot (1994) found that less than half of the studies found a negative relationship between overall performance goals and intrinsic motivation. When the performance goals were reclassified into approach and avoidance orientations, however, over 90% of the studies demonstrated that performance-avoidance goals undermine intrinsic motivation. In a follow-up study to this meta-analysis, Elliot and Harackiewicz conducted two experiments in which they tested the effects of achievement goals and avoidance orientations on intrinsic motivation. Consistent with previous research, only those with the performance-avoidance orientation demonstrated negative effects on intrinsic motivation and task involvement.

The results from this line of research strongly indicate that the avoidance orientation, or fear of failure, negatively affects intrinsic motivation. A more recent meta-analysis reported similar findings (Rawsthorne & Elliot, 1999). In addition to reporting that performance goals undermine intrinsic motivation, researchers found that this effect was moderated by whether the participants in these studies were offered competence-affirming feedback. When individuals received positive comments regarding their participation in the tasks assigned to them, those with a performance orientation were observed to be less intrinsically motivated than individuals with a mastery orientation. Having a performance orientation did not negatively influence individuals in situations in which they received negative feedback or no comments at all. In these conditions there were no differences in interest or task persistence between individuals with a performance or mastery orientation. Rawsthorne and Elliot also found that the undermining effect was moderated by whether a performance-approach versus performance-avoidance orientation was induced within the experimental design. Experimental procedures in which

participants' attention was directed toward the possibility of a negative performance outcome (the performance-avoidance condition) had a negative impact on participants' self-reported enjoyment and free-choice persistence. This latter finding suggests that the approach-avoidance distinction plays a significant role in how individuals' intrinsic motivation can be undermined in conjunction with mastery and performance goals.

Achievement Goals and Research Variables

Recently, achievement goals have become a subject of interest in the literature pertaining to counseling psychology doctoral students' research interest and productivity (e.g., Deemer, Martens, & Podchaski, 2007). Deemer (2010) investigated the relationship between research self-efficacy and achievement goals. After controlling for career-related goals and year in training, he found that mastery-approach goals positively predicted research self-efficacy whereas both mastery-avoidance and performance-avoidance goals were negative predictors of research self-efficacy. Given that the avoidance orientation is defined by being motivated to avoid negative outcomes, it is not surprising that this approach to research would be related to low research self-efficacy.

In an effort to obtain further information regarding achievement goals and variables related to research training, Deemer, Carter, and Lobrano (2010) developed the Achievement Goals for Research Scale (AGRS). This scale offers a way to measure the achievement goal orientation – mastery-approach, performance-approach, and performance-avoidance – as they pertain to graduate students' motivation toward research. Preliminary evidence for the AGRS indicated that it is an appropriate tool for measuring achievement goals within research motivation. The recent development of the AGRS, along with recent studies exploring achievement goals and research variables,

indicates that achievement motivation is a relevant area of interest in regard to understanding what propels psychology doctoral students to conduct research.

Emotional Perspective on Fear of Failure

Birney et al. (1969) theorized that it is the consequences associated with failure rather than the actual failure to complete a specific task that invokes fear. Specifically, they hypothesized that there are three aversive consequences for individuals with fears of failure who do not achieve their goals: (a) decreased beliefs about one's abilities, (b) nonego punishments, and (c) social devaluation. Decreased beliefs about one's abilities occur when individuals assume that they have overestimated their skills, and thus experience greater external locus of control and diminished self-efficacy. Nonego punishments refer to the tangible losses associated with the failure as well as feelings of hopelessness, wasted effort, and an uncertainty about the future. Finally, social devaluation involves feelings of shame or embarrassment and concerns related to how others will perceive their failure, including the belief that others will be disappointed, feel let down, or become disinterested in them. Recent research has supported fear of failure as a multidimensional construct. Specifically, Conroy (2003) found that shame and embarrassment, diminishing one's self-estimate, experiencing uncertainty about the future, and worrying that others will be upset or lose interest are all determinants of avoidant goal behavior.

Studies suggest that individuals who fear failure attempt to preserve their self-concept by implementing defensive strategies which enable them to attribute the cause of potential failures to factors other than their own abilities, namely self-worth protection, self-handicapping, and defensive pessimism. Self-worth protection refers to the

purposeful withholding of effort so that failure is attributed to a lack of trying rather than incompetence (Thompson, 1993, 1994). Self-handicapping describes imposing real or imagined obstacles so that they can later be used as an excuse for failure. Self-handicapping strategies include procrastination (Ferrari & Tice, 2000; Onwuegbuzie, 2000), creating unrealistically high achievement goals, and making choices that will likely hinder performance (e.g., drug use; Covington, 1992). Defensive pessimism involves adopting exceedingly low expectations or minimizing the importance of successfully completing a task in order to avoid the potential anxiety associated with taking the assignment seriously (Norem & Cantor, 1986a, 1986b). Research suggests that although these fear tactics may initially protect individuals' self-esteem, the long term consequences of habitual self-handicapping can lead to a host of negative achievement outcomes among populations of students across all age groups (Isleib, Vuchinich, & Tucker, 1988; Rhodewalt, Morf, Hazlett, & Fairfield, 1991).

Individuals who fear negative consequences, and thus adopt an avoidance orientation, become motivated to act in ways that, above all, serve to avoid threats to their self-concept. As a result, fear of failure has been linked to a host of behaviors that are detrimental to academic achievement, including procrastination (Ferrari & Tice, 2000; Onwuegbuzie, 2000), purposeful withholding of effort (Thompson, 1993, 1994), and setting unrealistic goals (Covington, 1992). Of particular relevance to the present research are the numerous studies that have linked the avoidance orientation to negative outcomes within the undergraduate college student population, such as lower grades (Elliot & Church, 1997), less intrinsic motivation (Elliot & Harackiewicz, 1996), and decreased subjective well-being (Elliot & McGregor, 1999; Elliot & Sheldon, 1997). For example,

Elliot and Sheldon examined the relationship between avoidance goals and fear of failure as well as the predictive utility of college students' fear of failure and their ability to achieve their goals within a semester. They found that fear of failure was strongly associated with avoidance goals and that avoidance goals yielded negative outcomes in a variety of areas. Avoidance goals were linked to dissatisfaction with progress and lack of enjoyment in the fulfillment of their goals. In addition to negative academic outcomes, students with avoidance goals tended to exhibit greater negative affect and decreases in self-esteem, vitality, sense of control, and overall life satisfaction (Elliot & Sheldon). These findings suggest that fear of failure plays a major role in academic outcomes.

A wealth of literature has linked the avoidance orientation and fear of failure to a host of negative academic outcomes, including diminished intrinsic motivation. Given that fear of failure has been linked to feelings of incompetence and fear of experiencing negative outcomes, it is reasonable to speculate that doctoral students high in fear of failure may lack self-efficacy and have concerns that engaging in research may result in negative consequences. At this time, no studies have investigated the effects of fear of failure on counseling and clinical psychology doctoral students.

A Tripartite Model of Research Motivation

According to the literature, motivation seems to play a considerable role in academic and occupational achievement, but has sparsely been examined in relation to research interest among graduate students. Deemer, Martens, and Buboltz (2010) hypothesized that three theorized motivational constructs – intrinsic motivation, extrinsic motivation, and fear of failure – could help to explain the variation in graduate students' research interest. Using the basic tenets of SDT and classic achievement motivation

theory, they suggested that positive research outcomes such as increased interest or productivity could be predicted by greater levels of intrinsic and extrinsic motivation and lower levels of fear of failure.

To test this model, Deemer, Martens, and Buboltz (2010) developed the RMS in a sample of graduate students within various science, technology, engineering, and mathematics (STEM) fields. The RMS contains three factors: IR, which was designed to reflect intrinsic reward; ER, which was designed to reflect extrinsic reward; and FA, which was designed to reflect the fear of failure construct. In their first study, results provided evidence for the reliability and factor structure of the RMS. Interestingly, a positive relationship between failure avoidance and extrinsic reward was also found. Researchers suggested that the relationship between these variables may reflect the complexity with which extrinsic motivation energizes behavior, and that more research is warranted to determine the effect of extrinsic motivation on behavior in the context of conducting research. Construct validity was also obtained by comparing the scales of the RMS to measures of fear of failure and academic intrinsic and extrinsic motivation. IR demonstrated the greatest evidence of construct validity while ER yielded the least. IR and ER both related positively to academic motivation, suggesting that they are potential predictors of positive academic outcomes. FA showed a positive relationship with measures of decisional procrastination and fear of failure. In their second study, Deemer et al. (in press) sought to obtain more evidence for the factor structure of the RMS. Academic professors from various STEM fields were recruited to participate. Results from these two studies suggest that the RMS may be an appropriate tool for examining how research motivation affects students' desire to pursue research in their careers.

Research Training Environment

One of the most widely studied factors known to influence research interest is the research training environment (RTE; Gelso, 1979, 1993). Gelso (1979) observed that counseling psychology students begin their training with excitement about the prospect of becoming practitioners, but with ambivalence about applying research in their future careers. This leaves programs that subscribe to a scientist-practitioner model of training with the difficult task of instilling research interest in order for the model to be successful. Gelso (1979) proposed that training programs should design a RTE with nine essential instructional and interpersonal ingredients in order to promote the value of science to their students. He theorized that RTEs should include instructional ingredients including (a) encouraging students to look inward to discover new research ideas, (b) showing students how science and practice can be wedded, (c) teaching students that all research is flawed, (d) teaching varied investigative styles and methodological approaches, and (e) reflecting on how research can be conducted in all practice settings (Gelso, 1979, 1993). Interpersonal ingredients of the RTE include (a) modeling of appropriate scientific attitudes and behaviors from faculty, (b) conveying that research can be a socially rewarding experience, (c) positive reinforcement of research participation, and (d) promoting early and low risk involvement in research activities. RTE theory was supported by the development of the Research Training Environment Scale (RTES; Royalty, Gelso, Mallinckrodt, & Garrett, 1986) and its subsequent revision, the Research Training Environment Scale-Revised (RTES-R; Gelso, Mallinckrodt, & Judge, 1996). RTE theory has generated a great deal of research since its inception, much of which has provided support for Gelso's (1993) proposed ingredients. Gelso reviewed the research of

RTE and concluded that there was moderate to strong support for six of the ingredients: (a) appropriate faculty modeling, (b) positive reinforcement of scientific activity, (c) introducing students to research early on in their careers in a minimally threatening manner, (d) emphasizing that all research is flawed, (e) demonstrating the value of varied approaches, and (f) showing students how science and practice can be integrated.

The RTE has been the most frequently investigated construct within the literature devoted to examining doctoral students' desire to conduct research in their professional careers. Positive student perceptions of the RTE have been linked to increased research interest (Bishop & Bieschke, 1998; Kahn, 2001), research self-efficacy (Bishop & Bieschke, 1998; Kahn; Kahn & Scott, 1997; Phillips & Russell, 1994), and scholarly productivity (Mallinckrodt & Gelso, 2002; Szymanski, Ozegovic, Phillips, & Briggs-Phillips, 2007). Many have theorized, however, that students' attitudes toward research results from an interaction between individual differences and elements of the RTE (Gelso & Lent, 2000; Kahn). For example, some studies have examined the RTE construct and its relationship to personality (Kahn & Scott, 1997; Mallinckrodt, Gelso, & Royalty, 1990).

Mallinckrodt et al. (1990) examined counseling psychologists' Holland (1997) personality types in relation to research interest. They found that Investigative and Investigative-Artistic individuals reported significantly greater research interest and that personality characteristics were more predictive of research interest than the RTE. In another study examining potential person-environment fit, Krebs, Smither, and Hurley (1991) found that Investigative interest and positive perceptions of the RTE were significantly associated with research productivity, and that the effect was strongest when

both personality and environment were considered. In a follow up study almost two decades later, Mallinckrodt and Gelso (2002) reviewed the research productivity of research participants from a 1986 study conducted by Royalty, Gelso, Mallinckrodt and Garrett. In their first study, participants were counseling psychology doctoral students. By 2002, these former students were now well into their professional careers, and their publications could be found through a psychology literature database. Mallinckrodt and Gelso found an interaction between the Artistic type and select ingredients of the RTE. Regarding RTE and scholarly productivity, they found that only two ingredients predicted publications for men (faculty modeling and viewing science as a social experience), whereas only one ingredient was predictive of research productivity for females (teaching varied approaches in research methodology).

Most studies examining the RTE have examined perceptions of the RTE through self-reported data from students on an individual level, yet the theory of RTE is described as a program-level construct. Kahn and Schlosser (2010) suggested that this is problematic because students' opinions may not accurately represent the environment and may be more reflective of individual characteristics such as personality. In a first attempt to separate the effect of individuals' perceptions from the actual qualities of RTEs, they investigated the impact of RTE on research interest, scholarly productivity, and research self-efficacy in a sample of clinical, counseling, and school psychology doctoral students by aggregating student ratings within each program. They found that programs whose RTEs had been rated positively had students with a greater interest in research. However, the individual differences in students' perceptions of RTEs within the same program were more strongly related to research interest than comparisons between programs. The results

of this study suggest that, while RTEs may help to shape students' career goals on a program level, individual characteristics and experiences may be more influential in determining research interest.

At this time, RTE theory is the most predominantly investigated construct within the research interest/productivity literature despite its consistent inability to explain large portions of the variance. The current study sought to investigate the effects of research motivation while controlling for the influence of RTE in addition to gender.

Research Interest

While many of the studies pertaining to psychologists' participation in research have used scholarly productivity as an outcome variable, some have suggested that psychology graduate students' research interest may be an important predictor of research productivity later in their careers (e.g., Bard, Bieschke, Herbert, & Eberz, 2000). According to Kahn and Scott (1997), research interest is directly related to scholarly productivity. Research interest is in turn indirectly influenced by socio-cognitive factors such as RTE and research self-efficacy. Using a cross-sectional research design, Kahn and Scott investigated various predictors of scholarly productivity among counseling psychology doctoral students. They found that research interest was directly predictive of participation in research while self-efficacy, RTE, and Holland (1985) personality type, were indirectly linked to interest in research. Kahn (2001) later refined Kahn and Scott's model to include the faculty mentoring relationship and research outcome expectations as mediating variables. Consistent with his earlier research, the results of this study demonstrated that research interest was directly related to scholarly productivity and

mediated by socio-cognitive variables. These studies suggest that the research interest construct can be used as a predictor of scholarly productivity.

Much of the research that has been conducted using the research interest construct has explored the development of research interests in relationship to the RTE. Studies have yielded mixed results and have indicated that some, but not all, of the ingredients proposed by Gelso (1979) are related to research interest. For example, Royalty and colleagues (1986) surveyed doctoral students from ten APA-accredited counseling programs about their perceptions of their RTE and research interest. Using multivariate analysis of variance they determined that six of the nine aforementioned prescribed ingredients significantly predicted research interest. In another study, Mallinckrodt et al. (1990) found that RTE accounted for only 4% of the variance in graduate students' current research interest and, of the nine ingredients, only two were significantly related to research interest – teaching students to wed science and practice and emphasizing that all studies are flawed and limited. In a later study, Gelso et al. (1996) also found only two of the nine ingredients to be related to research interest – teaching students to look inward for research ideas and, consistent with the previous study, emphasizing that all studies are flawed and limited.

Because research focusing on RTEs suggests that the training environment accounts for only a limited amount of the variability in graduate student research interest, many have proposed that its effect is mediated by social-cognitive variables, namely research self-efficacy and research outcome expectations (Bishop & Bieschke, 1998). While some studies have established a direct link between research interest and self-efficacy (Kahn & Scott, 1997; West, Kahn, & Nauta, 2007), others have revealed only an

indirect effect (Kahn, 2001). Research outcome expectations, however, have consistently been identified as a robust predictor of research interest among counseling psychology doctoral students. For example, Bieschke and colleagues (1995) examined RTE, self-efficacy, and outcome expectations as predictors of rehabilitation counseling graduate students' reported interest in conducting research during their careers. The results of their study showed that only outcome expectations explained a significant portion of the variance (43%) in students' research interest.

Although there have been many studies that have investigated self-reported research interest in counseling psychology students, far less research in this area has included clinical psychology doctoral students. In one study examining graduate student research interest, Goodman-Perl and Kahn (1983) found that 22% of the clinical psychology students sampled endorsed a desire to incorporate research into their professional careers. In a later study, researchers found that only 14% of clinical psychology doctoral students expressed an interest in conducting research (Cassin et al., 2007). In one longitudinal study sampling both clinical and counseling psychology doctoral students, researchers gathered information regarding participants' interest in both research and clinical practice as well as actual time spent engaging in these activities (Zachar & Leong, 2000). Participants were first surveyed as graduate students in 1989 and again in 1999 once they had attained their degrees and started their professional careers. The results of this decade long study revealed that counseling and clinical psychology doctoral students reported less interest in research than in clinical practice with no significant differences between clinical and counseling students. The interests reported by the participants remained stable over the ten- year period. Furthermore,

participants' interests as graduate students were directly correlated with how much time they reportedly spent on practitioner or research-related activities in their careers. These results are consistent with those of similar studies using counseling psychology doctoral students as participants (Cobb et al., 2004).

It was not until recently that researchers started to focus their attention on the factors affecting research interest in the clinical psychology population. West et al. (2007) explored the relationship between various learning styles, research interest, and research self-efficacy in a population of psychology graduate students that included individuals from both clinical and counseling psychology doctoral programs. Their results revealed that students with more intuitive and verbal learning styles reported greater interest in research. Their analyses did not demonstrate any significant differences in level of research interest across clinical and counseling students.

To date, there has been only one study that has examined types of motivation in relation to research interest. Deemer et al. (2007) examined the factors underlying counseling psychology doctoral students' levels of research interest and their relationship to mastery and performance goals. They found that mastery approach goals positively predicted research interest while performance avoidance goals negatively predicted research interest. In addition to this, Deemer and his colleagues (2007) conducted a hierarchical regression using the RTE, achievement goals, research self-efficacy, research outcome expectations, and demographic variables to predict research interest. They found that achievement goals accounted for 24% of the variance, which was significantly more than the other variables.

Hypotheses

The literature suggests that clinical and counseling psychology doctoral students report low levels of research interest and that most do not participate in scholarly activity in their careers (Cassin et al., 2007; Fitzgerald & Osipow, 1988; Goodman-Perl & Kahn, 1983; Parker & Detterman, 1988). Scholars within both fields of psychology contend that this is an issue of great concern and have called for an examination of the factors contributing to this trend (Gelso, 1979; Stricker, 1997). Researchers have identified some contextual and individual factors related to research interest (e.g., Kahn, 2001), such as conditions in RTEs, personality characteristics, and self-efficacy. Although these variables seem to be linked to research interest, many studies have found that they do not account for a substantial portion of the variation in research interest in the counseling psychology student population, and virtually no studies have examined these factors in the clinical psychology student population. Recently, it has been suggested that motivational dispositions may play a critical role in research interest and that they may also affect the importance of factors within RTEs (Deemer, Martens, & Buboltz, 2010; Deemer et al., in press). The present study attempted to obtain further evidence for the factor structure of the RMS using a population of clinical and counseling psychology doctoral students. It also examined the relationship between types of motivation and research interest in this sample. The following hypotheses were tested:

Hypothesis One

The RMS will maintain its three-factor structure, namely intrinsic motivation as measured by the IR scale, extrinsic motivation as measured by the ER scale, and fear of

failure as measured by the FA scale, in a sample of counseling and clinical doctoral students. The structure will show adequate fit as evidenced by various fit indices.

Justification for Hypothesis One

The RMS retained its three-factor structure in a sample of counseling psychology doctoral students (Deemer, Martens, & Buboltz, 2010) and also in a sample of college professors in STEM fields (Deemer et al., in press). A review of the literature indicates that counseling and clinical psychology doctoral students show no significant differences from one another across measures of research interest (West et al., 2007) and scholarly productivity (e.g., Brems et al., 1996). Given the similarities between clinical and counseling psychology doctoral students, it was expected that the factor structure would remain the same.

Hypothesis Two

Fear of failure, as measured by the FA scale of the RMS, will be a negative predictor of research interest, as measured by the Interest in Research Questionnaire (IRQ; Bishop & Bieschke, 1994), when controlling for RTE, as measured by the Research Training Environment Scale Revised-Short Form (RTES-R-S; Kahn & Miller, 2000), in a sample of counseling psychology doctoral students.

Justification for Hypothesis Two

According to McClelland et al. (1953), individuals who fear failure avoid situations in which they perceive that they may not be successful in achieving their goals. Further supporting this theory, many studies have linked fear of failure with a multitude of negative academic outcomes such as decreased intrinsic motivation (Elliot & Harackiewicz, 1996) and decreased task persistence (Onwuegbuzie, 2000). Given that

research endeavors are not always successful and therefore carry risk, it was predicted that individuals who score high on measures of fear of failure would be more likely to indicate a lack of interest in conducting research.

Hypothesis Three

Fear of failure, as measured by the FA scale of the RMS, will be a negative predictor of research interest when controlling for the RTE in a sample of clinical psychology doctoral students.

Justification for Hypothesis Three

As was previously stated, researchers have suggested that individuals who fear failure are more likely to experience negative academic outcomes (e.g., Onwuegbuzie, 2000). It was expected that, like counseling psychology doctoral students, clinical psychology doctoral students who fear failure would have difficulty carrying out research projects because they experience the same risk of failure when testing their hypotheses in research settings.

Hypothesis Four

Extrinsic motivation, as measured by the ER scale of the RMS, will be a positive predictor of research interest when controlling for the RTE in a sample of counseling psychology doctoral students.

Justification for Hypothesis Four

While proponents of SDT contend that the presence of extrinsic motivation undermines performance and intrinsic motivation, others have argued that extrinsic motivation may also contribute to successful academic outcomes (Cameron & Pierce, 1994; Cameron et al., 2001). Covington (2000) found that most students report that grades

are important to them while concurrently reporting intrinsic motivation to learn. He suggested that external rewards such as grades only interfere with intrinsic motivation when students seek higher grades as a means for avoiding failure. Consistent with these findings, it was expected that counseling psychology doctoral students' reported levels of extrinsic motivation would be positively related to their research interest.

Hypothesis Five

Extrinsic motivation, as measured by the ER subscale of the RMS, will be a positive predictor of research interest when controlling for RTE in a sample of clinical psychology doctoral students.

Justification for Hypothesis Five

As was previously stated, research suggests that extrinsic motivation can be positively linked to desirable academic outcomes in college students (Lin et al., 2001). Thus, it was expected that, like counseling psychology doctoral students, clinical psychology doctoral students who report heightened levels of extrinsic motivation would endorse greater amounts of interest in research.

Hypothesis Six

Intrinsic motivation, as measured by the IR scale of the RMS, will be a positive predictor of research interest when controlling for RTE in a sample of counseling psychology doctoral students.

Justification for Hypothesis Six

Self-determination theorists have suggested that individuals who are intrinsically motivated to complete a task are more creative and successful in their endeavors (Deci & Ryan, 1985, 2000a). Numerous studies have demonstrated a link between self-determined

types of motivation to positive outcomes in both educational and employment settings (e.g., Deci & Black 2000; Fernet et al., 2004; Judge et al., 2005; Lam & Gurland, 2008). Therefore, it was expected that counseling psychology doctoral students who endorse a greater level of intrinsic motivation would also report greater levels of research interest.

Hypothesis Seven

Intrinsic motivation, as measured by the IR scale of the RMS, will be a positive predictor of research interest when controlling for RTE in a sample of clinical psychology doctoral students.

Justification for Hypothesis Seven

As was previously stated, research strongly supports a link between intrinsic motivation and measures of academic and occupational outcomes (e.g., Deci & Black, 2000; Fernet et al., 2004; Judge et al., 2005). Given the similarities between clinical and counseling psychology doctoral students, it was expected that clinical psychology students who endorse high levels of intrinsic motivation would report increased interest in research.

Hypothesis Eight

There will be an interaction between scores of extrinsic motivation as measured by the ER subscale of the RMS and intrinsic motivation as measured by the IR subscale of the RMS, such that an interaction between IR and ER will be a unique contributor to the prediction of research interest.

Justification for Hypothesis Eight

Given that research is a fundamental component of training programs which adhere to the scientist-practitioner model, research participation inevitably becomes a

critical component of how students are evaluated. Research suggests that, in conditions in which students are being evaluated, high achieving college undergraduates identify grades as an important motivator, and thus are extrinsically motivated to some degree (Van Etten, Pressley, Freeburn, & Echevarria, 1998). This has led many researchers to speculate that it is the level of extrinsic motivation, rather than extrinsic motivation itself that negatively predicts academic success. Lin et al. (2001) examined the effects of college students' motivation on grades. They found that individuals with moderate scores on extrinsic motivation and high scores of intrinsic motivation received the highest grades. When examined independently, a moderate rather than high level of extrinsic motivation was positively related to grades while academic performance increased with levels of intrinsic motivation.

CHAPTER TWO
METHOD

Participants

Participants were graduate students recruited from American Psychological Association (APA) accredited counseling and clinical psychology doctoral programs and APA-accredited internships within the United States and Canada. Both Psy.D. and Ph.D. students were invited to participate. Participation was voluntary, and participants were treated in accordance with the ethical guidelines established by the APA (2002). After removing 22 participants who had completed less than 90% of the items in the surveys, the sample consisted of 285 participants. The majority of the participants were female (78.6%). Less than half of the participants (42.8%) were reportedly pursuing a degree in counseling psychology whereas 57.2% were in clinical psychology programs. The majority indicated that they were pursuing Ph.D.s (75.8%) rather than Psy.D.s (23.2%), and 1% of participants (n = 3) did not indicate which degree they were pursuing. Participants' ages ranged from 22 to 53 (M = 28.43, SD = 5.17) years. Regarding years in training, 21.8% were first year graduate students, 14.0% were second year students, 15.8% were in their third year, 18.2% were fourth year students, and 30.2% were fifth year students or beyond. Reported ethnicities were as follows: Caucasian (n = 232, 81.4%), African American (n = 17, 6.0%), Hispanic (n = 8, 2.8 %), Asian/Pacific Islander (n = 12, 4.2%), East Indian (n = 2, 0.7%), Aboriginal/American Indian/Alaskan Native (n = 1, 0.4%), Multiracial (n = 11, 3.9%), and "Other" (n = 2, 0.7%).

Measures

Demographic Questionnaire. The demographic questionnaire (see Appendix A) consisted of 10 items. Participants were asked to provide the following demographic information: (a) age; (b) gender; (c) ethnicity; (d) program model; (e) type of program (clinical/counseling); (f) type of degree (Ph.D./Psy.D.); and (g) year in program.

Research Motivation Scale (RMS). The RMS (Deemer, Martens, & Buboltz, 2010) is a 20-item self-report measure that assesses motivation toward research (see Appendix B). The RMS is comprised of 3 scales: (a) failure avoidance (FA); (b) intrinsic reward (IR); and (c) extrinsic reward (ER). Items within the FA scale are intended to measure fearful affect and self-handicapping behaviors such as low persistence and choosing easy tasks (e.g., "I want to pursue less difficult research projects that I know will guarantee a successful outcome"). IR and ER items were designed to reflect Deci and Ryan's (1985, 2000a) definitions of intrinsic (e.g., "Conducting research provides me with feelings of satisfaction") and extrinsic motivation (e.g., "I want to be recognized by my colleagues as a competent researcher"). Items are scored on a 5-point Likert-type scale, with rating points from 1 (*strongly disagree*) to 5 (*strongly agree*). In a study using participants from a heterogeneous sample of master's and doctoral graduate students within STEM fields, the RMS retained its proposed 3-factor structure (Deemer, Martens, & Buboltz). The alpha internal consistencies for each of the subscales were as follows: .90 for IR, .78 for ER, and .79 for FA. For the current study, alpha coefficients were: IR ($\alpha = .90$), ER ($\alpha = .78$), and FA ($\alpha = .81$). Deemer, Martens, and Buboltz demonstrated convergent validity of the RMS subscales. IR, ER, and FA correlated positively with other previously established measures of these constructs. Each subscale also demonstrated evidence for

discriminant validity. IR corresponded negatively to measures of fear of failure, self-handicapping, and amotivation, ER was negatively related to amotivation. Finally, FA was unrelated to a measure of positive reward sensitivity and significantly positively related to a predisposition toward criticism and punishment.

Interest in Research Questionnaire (IRQ). The IRQ (Bishop & Bieschke, 1994) is a 16-item self-report scale that measures students' level of interest in various research activities (see Appendix C). These items reflect several levels of research participation, including learning about research (e.g., "Taking a statistics course"), conducting research (e.g., "Collecting data"), as well as applying research to clinical practice (e.g., "Conducting research at the site of counseling practice"). The instructions inform participants that "research" is defined by both qualitative and quantitative methods. Respondents are asked to indicate their degree of interest in these various aspects of research participation on a 5-point Likert-type scale, ranging from 1 (*very disinterested*) to 5 (*very interested*). Early studies using the IRQ resulted in alpha coefficients ranging from .89 to .93 in samples of counseling psychology doctoral students (Bard et al., 2000; Bishop & Bieschke, 1998). In a recent study using a sample of clinical, counseling, and school psychology doctoral students, Cronbach's alpha was .92 for the IRQ (Kahn & Schlosser, 2010).

Consistent with previous research, Cronbach's alpha was .92 for the present study. Evidence for the IRQ's convergent and discriminant validity has been demonstrated through its positive correlations with the Investigative personality style and negative correlations with Artistic, Conventional, Realistic, Enterprising, and Social styles as measured by Holland's (1985) Vocational Preference Inventory. IRQ scores have been

shown to positively correlate to students' perceptions of the RTE and research self-efficacy among counseling psychology students (e.g., Bishop & Bieschke, 1998; Kahn, 2001).

Research Training Environment Scale-Revised-Short Form (RTES-R-S). The RTES-R-S (Kahn & Miller, 2000) is an 18-item measure of the 9 optimal ingredients of RTEs (see Appendix D), which include (a) encouraging students to look inward to discover new research ideas; (b) showing students how science and practice can be wedded; (c) teaching students that all research is flawed; (d) teaching varied investigative styles and methodological approaches; (e) reflecting on how research can be conducted in all practice settings;(f) modeling of appropriate scientific attitudes and behaviors from faculty; (g) conveying that research can be a socially rewarding experience; (h) positive reinforcement of research participation; and (i) promoting early and low risk involvement in research activities. These items were selected from the RTES-R (Gelso et. al., 1996). The nine subscales contain two items each, one of which is inversely scored. However, only the RTES-R-S total score was used for the purposes of this study. Items are scored on a Likert-type scale with rating points ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Previous studies have reported suboptimal alpha coefficients for the individual scales (e.g., Gelso et. al., 1996). Thus, only the total scale score was used in this study. Alpha coefficients for the total scale score of the RTES-R-S have been found to range from .86 (Kahn & Miller, 2000) to .88 (Deemer et al., 2007). Cronbach's alpha for the current study was .84. Evidence for convergent validity of this scale was established through significant positive correlations with research self-efficacy and attitudes toward research (Deemer et al., 2007; Gelso et. al., 1996). Discriminant validity for the

RTES-R-S has been demonstrated through its inverse relationship with measures pertaining to interest in the role of becoming a practitioner (Gelso et. al., 1996).

Data Analysis

Prior to data analysis, outliers were investigated using Cook's distance and the data were inspected for missing values. No outliers were extreme enough to warrant attention. Cases missing more than 10% of responses were removed from the final analyses, as is frequently recommended (e.g., Field, 2005). The missing values in cases missing less than 10% of responses were replaced with the overall mean for the omitted item.

Data from the present sample were investigated using the maximum likelihood method, which is based on assumptions of multivariate normality. The data were assessed for normality and homoscedasticity. A visual inspection of the data by means of histograms, residual plots, and q-q plots indicated that none of the variables departed problematically from normality. Additionally, *z* tests were performed to obtain kurtosis and skewness values to further assess for normality (Field, 2005). Finally, multicollinearity was assessed by regressing research interest on the variables to be used as predictors, and the subsequent tolerance values were examined. Variance inflation factor scores were less than 10, indicating no collinearity among the variables (Field).

In the first level of analysis, frequencies and descriptive statistics were obtained for the demographic variables. For gender, females were coded as 1 and males were coded as 2. Pearson correlations were calculated to explore significant relationships between research interest, RTE, IR, ER, and FA. Analyses of variance (ANOVA) and *t*-tests were conducted to investigate possible relationships between demographic and

research variables. Finally, 2 x 2 factorial ANOVAs were employed to investigate the differences between degree type (Ph.D. vs. Psy.D.) and program type (clinical vs. counseling) on research interest and the research motives.

Two confirmatory factor analyses (CFAs) were conducted using Mplus version 6.11 (Muthén & Muthén, 2010) to test the factorial invariance of the RMS with maximum likelihood as the estimation method. A CFA was first conducted with the overall sample of clinical and counseling psychology doctoral students and was followed by a multigroup confirmatory factor analysis (MGCFA) to compare the fit of the model across degree type. The overall fit of the model was examined using the chi-square test. It should be noted that with maximum likelihood method, lower values of chi-square tests indicate better fit whereas higher values suggest significance for other nonparametric tests. As a result, the chi-square tends to be sensitive to sample size (Kline, 2005). With this limitation in mind, additional fit tests were also performed as is common practice when conducting a CFA. These included the Akaike information criterion (AIC), comparative fit index (CFI), the standardized root mean square residual (SRMSR), and root mean square error of approximation (RMSEA). The AIC is a predictive fit index and is considered to be a good method for comparing non-nested models (Schreiber et. al, 2006). The CFI is an incremental fit index in which the target model is compared to the baseline model. The values of the CFI range from 0 to 1. Values closer to 1 indicate an adequate model fit when using the CFI. As a general rule, CFI values greater than .90 are said to indicate adequate model fit (Hu & Bentler 1999; Schreiber et. al, 2006). The SRMR, like chi-square, is classified as an absolute fit index. The SRMR can be described as the mean discrepancy between the observed correlations and those predicted in the theorized model

(Brown, 2006). The SRMR can take on a range of values between 0 and 1 with values of .08 or less as an indication of acceptable model fit (Brown, 2006; Schreiber et al., 2006). The RMSEA is sometimes categorized as an absolute fit index, but unlike other measures of absolute fit, the RMSEA takes the simplicity of the model into account by showing preference for the most parsimonious model (Brown, 2006). RMSEA values equal to or less than .05 indicate good fit, values ranging from .05 to .08 suggest an acceptable fit, and values equal to or greater than .10 indicate a poor fit (Browne & Cudeck, 1993).

Next, nine hierarchical regression analyses were conducted to examine research motivation as a predictor of research interest when controlling for RTE and gender in (a) a sample of clinical psychology doctoral students, (b) a sample of counseling psychology doctoral students, and (c) a combined sample of all participants. Finally, a hierarchical regression analysis was performed on the whole sample to examine the interaction between the overall sample's scores on the IR and ER scales of the RMS. Given that these regressions were all performed using the same pool of participants, a Bonferroni correction was employed to guard against the potential for a Type 1 error (Field, 2005). As such the threshold of statistical significance used for all ten regressions was altered from .05 to .005 to reduce the risk of reporting false significance within these analyses.

Procedure

Permission to conduct this study was granted by the Institutional Review Board of Louisiana Tech University (see Appendix E). An email describing the present study and requesting voluntary participation of students was sent to department chairs of APA-accredited clinical and counseling psychology doctoral programs. Department chairs were asked to forward the email to their students if they wished to include their program in the

study. The email briefly described the purpose of the study and directed participants to an electronic portal if they elected to participate. Before completing the survey, participants were first brought to a web page in which they were asked to read about their rights and provide an electronic signature signifying their informed consent (see Appendix F). Participants who chose to complete the survey were given the opportunity to enter into a raffle in which two people were randomly selected to win a $50 gift card.

CHAPTER THREE

RESULTS

Descriptive Statistics and Reliabilities

Table 1 contains the reliability coefficients, means, and standard deviations for the IRQ, RTE, and scales of the RMS. Cronbach's alpha coefficients for all variables were above .70, suggesting adequate internal consistencies for all variables used in this study. Reliability coefficients for the IR ($\alpha = .90$), ER ($\alpha = .78$), and FA ($\alpha = .81$) scales of the RMS were comparable to or greater than those reported in earlier studies (Deemer, Martens, & Buboltz, 2010; Deemer et al., in press). The means for the IR, ER, and FA scale were somewhat lower than was found in a previous sample of counseling psychology doctoral students (Deemer, Martens, & Buboltz). Separate means and standard deviations were also calculated across groups of clinical and counseling students and males and females (see Table 2).

Pearson correlations were analyzed for all the variables and are represented in Table 3. IR was significantly positively correlated with research interest ($r = .86, p < .001$), RTE ($r = .28, p < .001$), and ER ($r = .65, p < .001$). FA was significantly negatively correlated with IR ($r = -.22, p < .001$), research interest ($r = -.17, p = .005$), and RTE ($r = -.21, p = .001$). Significant positive correlations were found between ER and IR ($r = .65, p < .001$), research interest ($r = .61, p < .001$), and RTE ($r = .21, p = .001$).

Table 1. *Descriptive and Reliability Statistics of Study Variables for Overall Sample*

Variable	*M*	*SD*	Cronbach's α
RTE	67.13	9.41	.84
IR	31.59	6.58	.90
ER	17.39	3.70	.78
FA	16.35	4.20	.81
IRQ	54.84	11.27	.92

Note. RTE = research training environment; IR = intrinsic reward; ER = extrinsic reward; FA = failure avoidance; IRQ = research interest.

Table 2. *Means and Standard Deviations by Sample and Gender*

	IR		ER		FA	
Group	M	SD	M	SD	M	SD
Clinical Sample	31.81	6.47	17.70	3.61	16.33	4.48
Male	31.46	6.96	17.38	4.05	16.09	4.01
Female	31.88	6.41	17.76	3.54	16.38	4.57
Counseling Sample						
Male	32.08	6.51	17.54	4.04	16.81	3.50
Female	30.94	7.23	16.72	3.77	16.17	4.07
Overall Sample						
Male	31.84	6.64	17.48	4.01	16.53	3.69
Female	31.52	6.73	17.37	3.66	16.30	4.38

Table 3. *Intercorrelations among Study Variables with Overall Sample*

Variable	1	2	3	4	5
1. RTE	-				
2. IR	.28**	-			
3. ER	.21*	.65**	-		
4. FA	-.21*	-.22**	-.05	-	
5. IRQ	.26**	.86**	.61**	-.17*	-

Note. * $p < .01$. ** $p < .001$.

T-tests were conducted to investigate the relationship between gender and the research variables. Results yielded no significant difference between gender and RTE, $t(261) = .599, p = .550$, IR, $t(272) = -.323, p = .747$, ER, $t(277) = -.200, p = .841$, FA, $t(278) = -.385, p = .700$, and the IRQ, $t(269) = -.608, p = .544$. A 2 x 2 factorial ANOVA examining program and degree type resulted in no significant main effects for IR $F(1, 270) = .744, p = .389$, ER $F(1, 275) = 1.882, p = .171$, FA $F(1, 276) = .290, p = .591$, and the IRQ $F(1, 267) = 1.266, p = .261$.

Confirmatory Factor Analysis

To address hypothesis one, a CFA and a MGCFA via maximum likelihood estimation were conducted to assess the three-factor structure of the RMS and compare its fit to other potential models. For the single group CFA testing the three-factor structure, all variances were fixed to one and the means were fixed to zero in order to estimate the model. Fixing variances to one assures that all items will be measured on the same scale (Kline, 2005). The results for the three-factor model were as follows: $\chi^2(167, N = 285) = 483.88, p < .001$, CFI = .88, RMSEA = .08, SRMR = .08, and AIC= 13708.122 (see

Table 4). Although the χ^2 statistic was significant, the accompanying indexes provided evidence for an acceptable model fit for the three-factor model.

A MGCFA was performed to assess the relative fit of the three-factor model across program type (counseling vs. clinical). This model was found to be a fair fit of the data: χ^2 (368, N = 285) = 744.09, p < .001, CFI = .86, RMSEA = .09, SRMR = .10, TLI = .86, AIC= 13742.87. Factor loadings were consistent across the overall, clinical, and counseling samples, and ranged from .42 to .89 (see Table 5). Factor correlations were consistent with no notable exceptions for the clinical and counseling (see Table 6) and overall samples (see Table 7).

Table 4. *Model Fit Statistics*

Model	χ^2	df	AIC	CFI	RMSEA	SRMR	90% CI for RMSEA
Overall Sample	483.88	167	13708.12	.88	.08	.08	(.07, .09)
Multi-Group Sample	744.09	368	13742.87	.86	.09	.10	(.08, .09)

Hierarchical Regression Analysis

Nine separate hierarchical regression analyses were performed to test hypotheses two through seven. For the regression analyses, a Bonferroni correction was applied to reduce the possibility of a Type I error. Thus, .005 was used as a threshold to determine statistical significance rather than .05. Interest in research was regressed onto a series of variables including gender and total RTE scores at step 1 and the scales of the RMS onto step 2. The results for step 1 were the same for the addition of each research motive. The first three regression equations included the sample of counseling psychology doctoral students and the results are represented in Table 8. Entry of RTE and gender at step 1

resulted in a non-significant regression model for the step, $F(2, 119) = 3.92, p = .022$, and explained 6% of the variance in research interest. This indicates that counseling students' gender ($\beta = .07$) and perceptions of RTE ($\beta = .24$) do not significantly contribute to research interest. For the research motives, the relationship between FA and research interest was assessed. Adding FA to the equation at step 2 explained an additional 9.3% of the variance, $\Delta F(1, 118) = 12.94, p < .001$ ($\beta = -.31$), which suggests that failure avoidance is a significant negative predictor of research interest when controlling for RTE and gender among counseling psychology students. Next, adding ER to the equation at step 2 explained an additional 28% of the variance, $\Delta F(1, 118) = 51.21, p < .001$ ($\beta = .55$), which suggests that ER is a significant predictor of research interest when controlling for RTE and gender. Finally, adding IR to the equation on step 2 explained an additional 64% of variance in research interest, $\Delta F(1, 118) = 254.51, p < .001$ ($\beta = .84$), indicating that IR is a strong predictor of research interest when controlling for gender and RTE in a sample of counseling psychology doctoral students.

The next three hierarchical regression analyses were performed using only clinical psychology students, and the results can be found in Table 9. The results for step 1 were the same for the addition of each research motive. Entry of RTE and gender at step 1 resulted in a non-significant regression model for the step, $F(2, 160) = 5.17, p = .007$, explaining 6% of the variance in research interest. This indicates that, while clinical

Table 5. *Standardized Factor Loadings for the RMS Model*

	Standardized Factor Loading		
Subscale/Item	Overall	Clinical	Counseling
Intrinsic Reward			
RMS1	.75	.74	.76
RMS4	.85	.85	.84
RMS7	.79	.77	.82
RMS9	.69	.68	.72
RMS11	.42	.42	.43
RMS13	.56	.53	.59
RMS15	.86	.84	.89
RMS17	.84	.82	.86
RMS19	.63	.62	.63
Failure Avoidance			
RMS2	.59	.62	.55
RMS5	.53	.56	.50
RMS8	.69	.69	.68
RMS14	.65	.70	.60
RMS16	.48	.54	.43
RMS18	.72	.75	.68
Extrinsic Reward			
RMS3	.57	.58	.57
RMS6	.80	.78	.81
RMS10	.57	.57	.56
RMS12	.72	.70	.75
RMS20	.80	.81	.79

Table 6. *Factor Correlations for the RMS Model in Clinical and Counseling Samples*

Factor	1	2	3
1. IR	-	.75**	-.19*
2. ER	.72**	-	.02
3. FA	-.40**	-.21	-

Note. * $p < .05$. ** $p < .001$. Factor correlations for the clinical sample are presented in the top diagonal; correlations for the counseling sample are presented in the bottom diagonal.

Table 7. *Factor Correlations for the RMS Model in Overall Sample*

Factor	1	2	3
1. IR	-		
2. ER	.73*	-	
3. FA	-.28*	-.07	-

Note. * $p < .001$.

psychology doctoral students' perceptions of the RTE ($\beta = .25$) was significant, gender ($\beta = .03$) did not contribute significantly to research interest. Adding FA to the equation at step 2 did not explain a significant portion of the variance, $\Delta F(1, 159) = .002, p = .967$ ($\beta = -.003$), which suggests that FA was not a significant predictor of research interest for clinical psychology doctoral students. Next, the relationship between ER and research interest was assessed. Adding ER to the equation at step 2 explained an additional 33% of

Table 8. *Results of Hierarchical Regression Analyses Predicting Research Interest in Counseling Sample*

Variable	*B*	SE *B*	*β*	R^2	ΔR^2
		Extrinsic Reward			
Step 1				.06	.06
Gender	1.65	2.16	.07		
RTE	.29	.11	.24		
Step 2				.35*	.28*
Gender	.43	1.82	.02		
RTE	.14	.09	.12		
ER	1.61	.23	.55*		
		Intrinsic Reward			
Step 1				.06	.06
Gender	1.65	2.16	.07		
RTE	.29	.11	.24		
Step 2				.70*	.64*
Gender	.28	1.23	.01		
RTE	.00	.06	.00		
IR	1.37	.09	.84*		
		Failure Avoidance			
Step 1				.06	.06
Gender	1.65	2.16	.07		
RTE	.29	.11	.24		
Step 2				.16*	.09*
Gender	2.25	2.07	.09		
RTE	.24	.10	.20		
FA	-.89	.25	-.31*		

Note. *$p < .001$.

Table 9. *Results of Hierarchical Regression Analyses Predicting Research Interest in Clinical Sample*

Variable	*B*	SE *B*	*β*	R^2	ΔR^2
		Extrinsic Reward			
Step 1				.06	.06
Gender	1.00	2.45	.03		
RTE	.30	.09	.25*		
Step 2				.39*	.33*
Gender	1.39	1.97	.04		
RTE	.17	.08	.14		
ER	1.86	.20	.59*		
		Intrinsic Reward			
Step 1				.06	.06
Gender	1.00	2.45	.03		
RTE	.30	.09	.25		
Step 2				.69*	.63*
Gender	1.01	1.40	.03		
RTE	.07	.05	.05		
IR	1.46	.08	.82*		
		Failure Avoidance			
Step 1				.06	.06
Gender	1.00	2.45	.03		
RTE	.30	.09	.25		
Step 2				.06	.00
Gender	1.00	2.46	.03		
RTE	.29	.10	.25*		
FA	-.01	.20	.00		

Note. * $p < .001$.

Table 10. *Results of Hierarchical Regression Analyses Predicting Research Interest in Combined Sample*

Variable	*B*	SE *B*	*β*	R^2	ΔR^2
			Extrinsic Reward		
Step 1				.06*	.06*
Gender	1.23	1.58	.05		
RTE	.29	.07	.24*		
Step 2				.37*	.31*
Gender	.93	1.23	.03		
RTE	.16	.06	.13		
ER	1.73	.15	.57*		
			Intrinsic Reward		
Step 1				.06*	.06*
Gender	1.23	1.58	.05		
RTE	.29	.07	.24*		
Step 2				.69*	.63*
Gender	.58	.90	.02		
RTE	.04	.04	.03		
IR	1.41	.06	.82*		
			Failure Avoidance		
Step 1				.06*	.06*
Gender	1.23	1.58	.05		
RTE	.29	.07	.24*		
Step 2				.08*	.02
Gender	1.28	1.57	.05		
RTE	.26	.07	.22*		
FA	-.34	.16	-.13		

Note. * $p < .001$.

the variance, $\Delta F(1, 159) = 87.44, p < .001$ ($\beta = .59$), which suggests that ER is a significant predictor of research interest when controlling for RTE and gender. Finally, the relationship between IR and research interest was investigated. Adding IR to the equation at step 2 explained an additional 63% of the variance, $\Delta F(1, 159) = 327.66, p < .001$ ($\beta = .82$), which suggests that IR is a strong predictor of research interest when controlling for gender and RTE in clinical psychology doctoral students.

Finally, the same hierarchical regression analyses were performed on a combined sample of clinical and counseling psychology doctoral students. Results can be found in Table 10. The results for step 1 were the same for the addition of each research motive. Entry of RTE and gender at step 1 resulted in a significant regression model for the step, $F(2, 282) = 9.10, p < .001$, and explained 6.1% of the variance in research interest. This indicates that students' gender ($\beta = .05$) and perceptions of RTE ($\beta = .24$) predict their interest in research. Adding FA to the equation at step 2 explained an additional 1.5% of the variance, $\Delta F(1, 281) = 4.56, p = .034$ ($\beta = -.13$), which suggests that FA is not a significant negative predictor of research interest when controlling for RTE and gender. Next, the relationship between ER and research interest was assessed. Entry of ER to the equation at step 2 explained an additional 31% of the variance, $\Delta F(1, 281) = 138.16, p < .001$ ($\beta = .57$), which suggests that ER is a significant predictor of research interest when controlling for RTE and gender. Finally, the relationship between IR and research interest was investigated. Adding IR to the equation at step 2 explained an additional 63% of the variance, $\Delta F(1, 281) = 583.01, p < .001$ ($\beta = .82$), indicating that IR is a strong predictor of research interest even when controlling for RTE and gender.

To examine the interaction between ER and IR for hypothesis eight, a hierarchical regression was conducted using the individual research motives as covariates at step 1. The research motives resulted in a significant regression model for the step, $F(3, 280) = 217.09, p < .001$. Adding the interaction of IR and ER at step 2 (after first centering IR and ER) did not explain a significant portion of the variance, $\Delta F(1, 279) = .020, p = .887$.

Results for Hypotheses

Hypothesis One. Hypothesis one stated that the RMS would maintain its three-factor structure, namely intrinsic motivation as measured by the IR scale, extrinsic motivation as measured by the ER scale, and fear of failure as measured by the FA scale, in a sample of counseling and clinical psychology doctoral students. Results from the first CFA revealed an acceptable model fit, $\chi^2 (167, N = 285) = 483.88, p < .001$, CFI = .88, RMSEA = .08, SRMR = .08, TLI = .87, and AIC= 13708.12. This means that the three-factor structure of the RMS was maintained and hypothesis one was supported. These results lend support for the utility of the RMS, as it is an appropriate tool for measuring research interest.

Hypothesis Two. Hypothesis two predicted that fear of failure, as measured by the FA scale of the RMS, would be a negative predictor of research interest when controlling for RTE and gender in a sample of counseling psychology doctoral students. Results from the hierarchical regression revealed that FA explained an additional 9.3% of the variance, $\Delta F(1, 118) = 12.94, p < .001$ ($\beta = -.31$), indicating that it is a negative predictor of research interest. Thus, hypothesis two was supported. These results suggest that fear of failure is a predictor of research interest for counseling psychology doctoral students.

Hypothesis Three. Hypothesis three predicted that fear of failure, as measured by the FA scale of the RMS, would be a negative predictor of research interest when controlling for RTE and gender in a sample of clinical psychology doctoral students. Results from the hierarchical regression indicated that FA did not explain a significant portion of the variance, $\Delta F(1, 159) = .002, p = .967$ ($\beta = -.003$), which suggests that FA was not a significant predictor of research interest for clinical psychology doctoral students. Thus, hypothesis three was not supported. These results suggest that fear of failure does not significantly negatively predict clinical psychology doctoral students' research interest.

Hypothesis Four. Hypothesis four stated that extrinsic motivation, as measured by the ER scale of the RMS, would be a positive predictor of research interest when controlling for RTE and gender in a sample of counseling psychology doctoral students. Results from the hierarchical regression revealed that ER explained an additional 28% of the variance, $\Delta F(1, 118) = 51.21, p < .001$ ($\beta = .55$), indicating that it is a significant positive predictor of research interest. Thus, hypothesis four was supported. These results suggest that extrinsic motivation is a predictor of research interest for counseling psychology doctoral students.

Hypothesis Five. Hypothesis five stated that extrinsic motivation, as measured by the ER scale of the RMS, would be a positive predictor of research interest when controlling for RTE and gender in a sample of clinical psychology doctoral students. The hierarchical regression revealed that ER explained an additional 33% of the variance, $\Delta F(1, 159) = 87.44, p < .001$ ($\beta = .59$), indicating that it is a significant positive predictor of

research interest. Thus, hypothesis five was supported. These results suggest that extrinsic motivation is a predictor of research interest for clinical psychology doctoral students.

Hypothesis Six. According to hypothesis six, intrinsic motivation, as measured by the IR subscale of the RMS, would be a positive predictor of research interest when controlling for gender and RTE in a sample of clinical psychology doctoral students. Results from the hierarchical regression revealed that IR explained an additional 64% of the variance, $\Delta F(1, 118) = 254.51, p < .001$ ($\beta = .84$), indicating that it is a significant positive predictor of research interest. Thus, hypothesis six was supported. These results suggest that intrinsic motivation is a strong predictor of research interest for clinical psychology doctoral students.

Hypothesis Seven. Hypothesis seven predicted that IR, as measured by the IR scale of the RMS, would be a positive predictor of research interest when controlling for gender and RTE in a sample of counseling psychology doctoral students. Results from the hierarchical regression revealed that IR explained an additional 63% of the variance, $\Delta F(1, 159) = 327.66, p < .001$ ($\beta = .82$), indicating that it is a significant positive predictor of research interest. Thus, hypothesis seven was supported. These results suggest that intrinsic motivation is a strong predictor of research interest for counseling psychology doctoral students.

Hypothesis Eight. Hypothesis eight stated that there would be an interaction between scores of extrinsic motivation as measured by the ER subscale of the RMS and intrinsic motivation as measured by the IR subscale of the RMS, such that a combination of scores of IR and ER would be a unique contributor to research interest. Results from the hierarchical regression revealed no significant interaction between scores of IR and

ER, $\Delta F(1, 279) = .020$ $p = .887$. Thus, hypothesis eight was not supported. This indicates that the interaction between the IR and ER scales is no more likely to predict research interest than when they are evaluated individually.

CHAPTER FOUR
DISCUSSION

The primary purposes of the present study were to obtain further evidence for the factor structure of the RMS using a sample of clinical and counseling psychology doctoral students, and to examine the relationship between types of motivation and research interest in this sample. It was hypothesized that research motives, as measured by the scales of the RMS, would be significant predictors of research interest beyond the RTE. Previous research has identified contextual and individual factors related to research interest, such as conditions in the RTE, personality characteristics, and self-efficacy (e.g., Gelso, 1979; Gelso, Mallinckrodt, & Judge, 1996). Although these variables seem to be linked to research interest (Kahn & Scott, 1997; West et al., 2007), studies have found that they do not account for a substantial portion of the variation in the counseling psychology population (e.g., Kahn, 2001), and virtually no studies have examined these factors in clinical psychology students. Recently, it has been suggested that motivational dispositions, namely extrinsic motivation, intrinsic motivation, and fear of failure, may play a critical role in research interest (Deemer, Martens, & Buboltz, 2010; Deemer et al., in press), but to date no studies have examined this relationship. The present study addressed these questions. In this chapter, a general overview of the findings is presented. The implications and limitations of this study are discussed, as are future directions for research.

Discussion of Findings

Pearson correlations revealed that all three research motives were significantly related to IRQ scores, with IR being the most strongly correlated. Of the three RMS scales, only FA was negatively correlated with IRQ scores, as was predicted. Evidence of discriminant validity of the RMS scales was obtained through factor correlations. Consistent with the theorized model, IR was positively correlated with ER and negatively correlated with FA, while FA demonstrated no significant relationship to ER. The relationships between these variables are consistent with previous findings (Deemer, Martens, & Buboltz, 2010).

Exploratory analyses revealed no significant effects for gender, type of program (clinical or counseling), and degree type (Ph.D. or Psy.D.) on IRQ scores, RTE scores, or the subscales of the RMS. This suggests that gender and program variables did not significantly relate to the outcome measures in this study. While no specific hypotheses were made regarding these analyses, the implications of these results warrant some discussion. The finding that there were no mean differences between gender and IRQ scores was surprising given that previous research has demonstrated that female professors produce fewer publications than their male counterparts (e.g., Leahey, 2006). One possible reason for this finding is that changes in research-related activity may occur between graduate school and professional careers. It may be that male and female graduate students maintain similar levels of research interest, but the challenges of acquiring and maintaining an academic appointment bring about gender discrepancies. Rothhausen-Vange, Marler, and Wright (2005) suggested that academic departments seem to train men and women differently and maintain different levels of expectations for

them. Others have noted that within science fields, women tend to prioritize the needs of their families above their jobs (e.g., Long, Allison, & McGinnis, 1993). Baker (2010) reviewed multiple qualitative studies concerning women in academia and observed that women's personal priorities, such as family, seem to be the major contributing factor in their level of contribution in the workplace. Thus, the differences between male and female participation in research may change over time in response to their environmental and familial factors.

Due to limited information regarding the similarities and differences between clinical and counseling psychology students' research behavior, hypotheses were not made about the differences between these two groups. The observed similarities between their outcome measure scores was nonetheless noteworthy considering that most studies examining the factors affecting research interest and productivity have excluded clinical psychology doctoral students. The present findings indicate that, in addition to sharing the problem of low research production, clinical and counseling psychology doctoral students report similar RTEs, levels of research interest, and research motivation. Given these results, it seems that regarding the research variables measured in this study, there are no significant differences between clinical and counseling psychology doctoral students.

The lack of differences found between Ph.D. and Psy.D. programs was surprising given that some of the central philosophical differences between the two degree types pertain to research production. Although both models emphasize the importance of using research to inform clinical practice, the two degree types tend to differ from one another in their approaches to teaching their students research topics, methods, statistics, and goals (McFall, 2006; Stoltenberg et al., 2000). In Psy.D. programs, the goal is typically to

produce superior practitioners rather than psychologists with equal training in research and clinical practice. As a result, Psy.D. students generally spend less time learning about research so that they may gain more extensive training in applied settings. The fact that this study revealed no differences between Psy.D. and Ph.D. students in research-related variables supports the notion that RTE and program philosophy are less influential than personal factors when it comes to making decisions about research involvement. Although no specific hypotheses were made regarding differences that might emerge across degree type, the implications of these results deserve examination and are discussed later in this chapter.

Hypothesis One

Hypothesis one stated that the RMS would retain its factor structure in a sample of clinical and counseling doctoral students. A CFA and a MGCFA were conducted via Mplus version 6.11 (Muthén & Muthén, 2010) to assess the construct validity of the three-factor structure of the RMS in a new sample of clinical and counseling psychology doctoral students. For both the CFA and MGCFA, the data did not demonstrate an exceptionally strong model fit. However, RMSEA and SRMR values indicated a fair model fit and were consistent with findings in previous studies (Deemer, Martens, & Buboltz, 2010; Deemer et al., in press). Thus, the present findings provided satisfactory empirical support for the model in this new sample. The MGCFA revealed no notable differences in the way clinical psychology and counseling psychology doctoral students responded to questions about their motivation to conduct research. This suggests that these two groups responded similarly to items about their motivation toward research and may even be considered to be one homogeneous group in future studies using the RMS.

Consistent with previous findings, IR demonstrated the greatest internal consistency and factor loadings (Deemer, Martens, & Buboltz, 2010). Of the items within this scale, those which referred to an inherent desire to conduct research (e.g., "I conduct research for the joy of it"; "Research in and of its self is enjoyable to me"; "I enjoy doing research for its own sake") demonstrated the highest factor loadings. These items seem to most closely represent the concept of intrinsic motivation as it has been described by Deci and Ryan (1985). FA items generally demonstrated the weakest factor loadings of the RMS scales, which is in contrast to an earlier study that revealed the lowest factor loadings to be within the ER scale (Deemer, Martens, & Buboltz, 2010). Overall, however, the strength of the factors within the hypothesized structure is consistent with factor loadings from earlier studies investigating the RMS (Deemer, Martens, & Buboltz; Deemer, et al., in press).

The fact that the RMS has consistently yielded fair, but not exceptional fits to the overall model, warrants some attention. In the first study to examine the factor structure of the RMS, participants were recruited from various STEM fields. Deemer, Martens, and Buboltz (2010) reported a fair model fit and suggested that the overall fit of the model of the RMS might increase if administered to a homogenous sample. The present study produced similar CFA results in a homogenous sample of clinical and counseling psychology doctoral students as evidenced by the lack of invariance found in the results from the MGCFA. This indicates that the homogeneity of the sample may not be the reason why the CFA results are demonstrating only fair fits to the model. Thus, it may be necessary to further investigate the factor loadings of the items within each subscale. It was noted that, while each subscale demonstrated good internal consistency, they all

contained items with low factor loadings. For IR, item 11 ("I have a need to understand specific scientific phenomena") yielded a factor loading of less than .50 for both clinical and counseling psychology doctoral students. Interestingly, this is the only item that does not specifically use the word "research" within this subscale and therefore may not tap into research interest as directly as the other items. For FA, none of the overall factor loadings fell below .50, but none exceeded .70. This suggests that these items may not be directly addressing fear of failure as a unified construct. For ER, overall factor loadings were higher than that of FA, but fell between .57 and .81. As has been previously noted, extrinsic motivation may be a difficult construct to measure given that there may be several different types (Deci & Ryan, 2000a). It is possible that some items are more reflective of the pure form of extrinsic motivation, external regulation, than others. For example, items 3 ("I conduct research to earn the respect of my colleagues") and 10 ("I want to leave my mark on my field") received the lowest factor loadings, and their meanings may more closely overlap with items associated with intrinsic motivation than those that make specific mention of receiving rewards (e.g., item 12, "I want to receive awards for my scientific accomplishments").

Overall, however, the fair fit of the CFA and MGCFA suggest that the RMS can be a useful tool for helping researchers to understand the effects of research motivation on research interest and scholarly productivity among graduate students and faculty within various STEM fields. In the future, researchers may want to consider further exploration of this scale and how it may be improved.

Hypotheses Two through Seven

Hypotheses two through seven stated that the individual RMS scales would be predictive of IRQ scores in samples of both clinical and counseling psychology doctoral students when controlling for gender and RTE. All of these hypotheses were supported with the exception of two; FA was not a significant negative predictor of IRQ scores for clinical psychology doctoral students and in a combined sample of clinical and counseling psychology doctoral students.

Gender and RTE were used as controls for each of the hierarchical regressions which tested these hypotheses. RTE accounted for a significant portion of the variance for each regression in a combined sample of clinical and counseling psychology doctoral students, but not when these groups were separated. The lack of significance found in the individual groups may reflect the conservative test of significance used for these hypotheses, as RTE was made non-significant within the individual groups only after a Bonferroni correction was applied. Gender was not a significant predictor of research interest across clinical psychology students and counseling psychology students. This was expected given that there were no observed mean differences between males and females on measures of research interest, RTE, and research motives.

FA was a negative predictor of IRQ scores for counseling psychology doctoral students, but contrary to hypothesis three, it was not a significant predictor of IRQ scores for clinical psychology doctoral students. These findings suggest that FA significantly decreases research interest for counseling psychology students, but not for clinical psychology students. Given the similar means on the FA scale in the two samples, one might speculate that clinical psychology students are no less fearful of failure, but that

their abilities to cope with the inevitable setbacks associated with research are more adaptive than those of counseling psychology students. At this time, it is unclear whether this coping mechanism is fostered within the clinical psychology doctoral programs or if characteristics of clinical psychology doctoral programs attract students who are impacted less by fear of failure than their counseling psychology counterparts. Given that the present findings, along with previous research, assert that there are more similarities than differences among these two groups (e.g., Cobb et al., 2004), this discrepancy needs to be replicated to ensure its existence and should be addressed in future research.

ER was a significant positive predictor of research interest across clinical psychology students and counseling psychology students, as it explained 33% of the variance for clinical psychology students and 28% of the variance for counseling psychology students. While this supported the current hypothesis and is consistent with previous findings, it is also contrary to a large body of evidence which suggests that ER can bring upon negative consequences within academic settings (e.g., Kasser & Ryan, 1996). One reason that has been given for such inconsistencies in the research on extrinsic motivation is that this construct may be more representative of situational factors than intrinsic motivation (Deemer, Mahoney, & Hebert Ball, in press). Unlike intrinsic motivation, which consistently predicts positive academic and vocational consequences, the behavioral outcomes of extrinsic motivation may be dependent on the environment as well as the targeted behavior. For example, when incentives are offered by supportive faculty they may be received more favorably and with less threat to overall research interest than when they are given by individuals who are generally considered less

nurturing to students' development. Continued research regarding extrinsic motivation and research interest is recommended and is discussed later in this chapter.

Of the three research motives, IR was the greatest predictor of IRQ scores, explaining an additional 63% of the variance for clinical psychology students and 64% of the variance for counseling psychology students. The findings indicate that intrinsic motivation is strongly linked with the desire to conduct research. SDT theorists have long suggested that intrinsic motivation reflects individuals' psychological needs for competence and autonomy (Deci & Ryan, 1985). It seems that for students interested in research, the act of performing research related activities is a vehicle which may help meet these underlying needs and may increase the likelihood that they will continue to conduct research in their professional careers.

When viewing these results through a historical lens, the data certainly support the notion that individuals' behavior cannot be reduced to a consequence of physiological drives or learned behavior. That IR was such a strong predictor of research interest over and above the RTE attests to the strength in which our internal desires energize us, despite the stimuli occurring in the environment. If research interest was solely a product of environmental influences one would expect the RTE and program type (Ph.D. vs. Psy.D.) to be greater predictors than IR. These findings have important implications for prospective students as well as clinical and counseling psychology training doctoral programs and are discussed later in this chapter.

In addition to the regression analyses used to test hypotheses two through seven, three hierarchical regressions were performed to investigate the predictive utility of the individual research motives in an overall sample of clinical and counseling psychology

doctoral students. Entry of gender and RTE at step 1 yielded results consistent with those of the previous analyses. While RTE was significant, gender did not account for a significant amount of variance in IRQ scores. Results indicate that ER and IR were positive predictors of IRQ scores over and above gender and RTE. FA was not a significant predictor of IRQ scores in the overall sample. Given the similarities in the findings between clinical and counseling psychology doctoral students, it was not surprising that the results did not change significantly after the samples were combined. This further attests to the homogeneity of the sample used in this study.

Hypothesis Eight

Finally, hypothesis eight stated that there would be an interaction between scores of ER and IR such that the scores of both subscales would be a unique positive predictor of IRQ scores. Contrary to predictions, the interaction of these variables did not help to explain a significant portion of the variance. The inconsistency between these results and previous studies that have demonstrated an interaction effect on other academic variables (e.g., Lin et al., 2001) reiterates the sheer complexity of the ER construct. While IR and ER were demonstrated to be important predictors of research interest on their own, the present findings indicate that they do not interact in such a way that uniquely contributes to greater interest in research. One possibility for why this finding is in contrast to the results of other studies is that the majority of previous research on extrinsic motivation concerns undergraduate college students or individuals still in grade school. These populations may be very different from graduate student populations. Lin et al. observed that extrinsic motivation, as measured by college students' desire to earn good grades, bolstered their actual grades when combined with reportedly high levels of intrinsic

motivation. For undergraduate students, however, grades may be viewed differently than in graduate school. One might speculate that grades become less important once one has achieved entry into graduate school and has begun taking more difficult courses. At that time, the primary goal may shift from getting the best grades to learning necessary information to succeed in future careers. It may also be that extrinsic motivation affects individuals greater at a younger age when they are still developing their interests and career paths. As students' schooling becomes gradually narrower in their areas of study, the undermining effect demonstrated so prominently with young children may attenuate once interests have become more solidified. Graduate school represents the final stage of school in which people have committed to extend their studies in a specialized area. At that point, external incentives in the environment that threaten individuals' pursuit of autonomy and competence may have less of an impact.

Implications

Considering the low amounts of research that are currently being produced by individuals within the fields of clinical and counseling psychology, unearthing new information regarding the factors that contribute to research interest is an important area of study. The present research provides new information that may be valuable in shedding light on the factors contributing to research interest and motivation. First, this study revealed some important information regarding the differences, or lack thereof, among training programs. As was previously discussed, the results of this study found no differences in research interest across Ph.D. and Psy.D. programs, and raises the question of whether these degrees are effectively passing along the philosophy of their training models onto their students. Given that Psy.D. programs were developed in part to provide

students with an alternative to research-intensive Ph.D. programs, the present findings suggest that this goal has not been achieved. For Ph.D. programs, whose intention is to produce psychologists who are involved in both science and practice, it seems that the scientist-practitioner model is not significantly influencing these students in a manner that is different from less research-intensive programs. Of all the variables considered in this study, underlying research motives of IR and ER were found to be most strongly predictive of research interest. Intrinsic motivation was most clearly and consistently demonstrated to be a major factor in predicting research interest. This, along with other findings from the study, suggests quite strongly that individual (or student-level) factors are more relevant to research interest than program-level factors. Simply put, the students who are most likely to demonstrate interest in research are those who are inherently motivated to engage themselves in the various aspects of psychological research. The finding that individual variables may be more important than the training models themselves indicates that clinical and counseling psychology doctoral programs may need to rethink the ways in which they differentiate themselves in terms of degree type. If Ph.D. and Psy.D. degrees are to continue to exist as alternate options, it may be appropriate for them to redefine themselves in a way that is congruent with the goals, knowledge, and philosophies which their students employ in their careers.

Another option that has presented itself in recent years is to unify doctoral training programs (e.g., Henriques & Sternberg, 2004). Henriques and Sternberg have suggested a new paradigm for psychology, termed Unified Professional Psychology (UPP). According to their model, psychology could become a stronger, more mature science if it were to (a) combine doctoral training programs; (b) develop a single, comprehensive framework; and

(c) offer a clear identity for professional psychologists. Regarding training programs, UPP asserts that, given the overwhelming similarities between them, combining training programs would not require an entire overhaul of the curriculum being taught. After a review of the courses being taught within school, clinical, and counseling psychology doctoral programs, Cobb et al. (2004) concluded that as little as 10% of programs' curriculum and practicum requirements would have to change in accordance with a new, unified framework. Morgan and Cohen (2008) reported similar findings. After reviewing and analyzing the similarities and differences between clinical and counseling psychology doctoral programs' brochures, they concluded that there were more differences within clinical and counseling programs than there were between these specialty areas. These findings suggest that training programs are very similar, but are labeled in such a way as to misleadingly present themselves as different branches of psychology. In the UPP framework, students would be offered generalist coursework that would be followed later by training in a specialized area. At this time, UPP may seem to be a radical idea, yet it offers a new way of considering how to address the incongruence between students' career aspirations and goals and the philosophies of training programs.

The present findings also provide important implications for how training committees select incoming students. For training programs whose goal is to produce students who will continue to generate research in their careers, it may be worthwhile for them to consider prospective students' intrinsic motivation to conduct research during their selection process. Recognizing the important role of intrinsic motivation may be very helpful for faculty within clinical and counseling doctoral programs in addressing the lagging research interest among their students.

Understanding students' research motivations may also be useful to vocational psychologists and other professionals who assist individuals in choosing appropriate career paths. It has been suggested that the theory of research motivation may correspond well to person-environment fit theories of vocational psychology and , as such, can be used to inform career decision-making (Deemer, Martens, & Buboltz, 2010). Person-environment fit refers to the idea that individuals are more satisfied with their careers when the elements of their position are congruent with their interests and personality characteristics (e.g., Dawis & Lofquist, 1984; Holland, 1986, 1997). Outcome research investigating person-environment fit suggests that congruence between individuals and their jobs is predictive of a wealth of positive outcomes, including increased job retention (e.g., Chatman, 1991) and job satisfaction (Kristof-Brown, Zimmerman, & Johnson, 2005; Spokane, 1985). Alternately, lack of person-environment fit has been found to be detrimental for both the individual as well as the organization. Regarding counseling and clinical psychology, students who commit to research-intensive training programs, but lack a strong desire to conduct research, may encounter greater difficulties. The incongruence between their environment and motivation may lead to decreased self-efficacy, frustration, and perhaps even academic withdrawal. Training programs in turn suffer by spending time and energy on producing scientist-practitioners who do not embrace this philosophy in their careers.

Regarding career counseling, research motivation may be a fruitful topic of discussion for prospective psychology students and their counselors. Students with an inherent desire to conduct research will be well suited for research-intensive psychology training programs, while those with less intrinsic motives may find a better fit within

practitioner-scholar models of training. Assisting students in finding the best fit between what intrinsically motivates them and different fields within psychology may help to generate greater research interest among psychology doctoral students who enroll in programs that emphasize research activity. This may also be helpful for training programs in that their students will more closely represent the goals and philosophies to which they subscribe.

Although intrinsic motivation was found to be more predictive of research interest than program-level factors, the findings from the present study do not necessarily indicate that doctoral programs are incapable of affecting their students' research interest. Extrinsic motivation was also a strong predictor of research interest, suggesting that programs may foster greater research participation by offering further incentives to their students. While no cumulative data on the use of external incentives within clinical and counseling psychology doctoral programs are currently available, an informal review of program websites suggest that considerable variability exists in the possible rewards students are offered for conducting research. Monetary scholarships, awards of recognition, or other various forms of external motivation are currently used, and the present research suggests that they may foster research interest in some students. While there is no current research on what types of incentives will strengthen students' desire to pursue research, previous research would suggest that rewards that do not undermine competence and autonomy would likely yield the greatest outcome.

Regarding the theories of SDT and achievement motivation, this study provided important information about how they can be used to better understand how types of motivation affect graduate students. As was previously noted, the majority of research on

intrinsic motivation, extrinsic motivation, and fear of failure has used samples comprised of college undergraduates or students in grade school. While information pertaining to these students is valuable for parents, teachers, and career counselors assisting them in reaching their career goals, it does not explain the factors that affect students' career decision making shortly before entering into their professional careers. Extrinsic motivation, for example, may not be as detrimental to student productivity at this stage because this type of motivation is a natural part of entering the workforce when in adulthood. In order to maintain the responsibilities of owning a home, paying bills, etc., earning money and gaining a notable reputation through promotions or rewards becomes a necessary part of a having a successful career. Additionally, fear of failure seemed to have less of a negative impact on clinical and counseling psychology doctoral students' research interest than it has been shown to have on younger students' academic achievement (e.g., Elliot & Church, 1997; Elliot & Sheldon, 1997). That fear of failure did not seem to negatively affect graduate students in this sample is likely associated with how students approach risk taking once they are in graduate school. Making the decision to enter into graduate school can be a costly and risky endeavor in and of itself, and perhaps students who make such a choice represent a more resilient part of the population when it comes to taking risks to achieve their goals. Regarding intrinsic motivation, it seems that this type of motivation is an integral component of goal achievement for clinical and counseling psychology doctoral graduate students and is just as important for students within this population as it has been for students at other levels of schooling (e.g., Gottfried et al., 2001). In sum, the present research offered important implications for how intrinsic motivation, extrinsic motivation, and fear of failure may affect students

differently, or similarly, toward the end of their academic careers. While decades of research have demonstrated that these types of motivation can be influential for academic achievement, it may be worthwhile for researchers to further examine how these types of motivation may change over time in terms of how they affect individuals' career decision making.

A final implication of this study is that the RMS was demonstrated to be an appropriate tool for investigating research motivation and can be used to further explore this important topic. According to the results from the current study, research motivation plays an important role in research interest, seemingly more so than environmental factors. The present research has simply provided a foundation, however, and has raised several questions about how research motivation affects research interest. The RMS has demonstrated that it will be very useful in investigating this topic and exploring future directions in this line of research.

Limitations

There were some limitations to this study that warrant consideration. One important issue which requires mentioning is that clinical psychology Psy.D. and clinical psychology Ph.D. students were combined to create an overall clinical psychology sample, but students pursuing these different degrees may actually be different enough from one another to call for separate categories. As was previously mentioned, Psy.D. programs tend to be less research intensive and differ in their approach to teaching their students research topics, methods, and goals (McFall, 2006; Stoltenberg et al., 2000). The two degree types were combined because the limited number of participants recruited from the clinical Psy.D. and Ph.D. programs alone would have minimized the amount of

statistical options available in the analyses. In the future, it may be optimal to collect data from enough participants to create three separate samples, counseling Ph.D, clinical Ph.D., and clinical Psy.D. in order to compare possible differences amongst these groups.

Another issue regarding the sample is possible self-selection bias. Because this survey was first delivered to training directors along with an invitation to distribute them to their students, it is possible that the training directors who would be most likely to forward the study are those who are more invested in research themselves. Additionally, the types of students who agreed to participate in this study may also be somewhat different from their peers in that they are more inclined to participate in research.

The imbalance between men and women in the sample also deserves consideration as a limitation. Any findings, or lack of findings, regarding gender may have been affected by the low number of male participants relative to female participants. Although this discrepancy is reflective of the gender breakdown in the fields of clinical and counseling psychology today (Association for Psychology Postdoctoral and Internship Centers, 2010), any final conclusions regarding the impact of gender would likely require a more balanced sample.

It is also worth noting that the data collected in this study were obtained solely through self-report measures, which makes the results susceptible to influence by a common method bias. Common method bias, also known as monomethod bias, refers to situations in which using the same method to collect data in a single study inflates correlations between the variables (Siemsen, Roth, & Oliveira, 2010). In future research, it may be beneficial to examine how the RMS relates to scholarly productivity or another method of measuring research participation that does not rely on self-report.

Finally, although the results of this research suggest that intrinsic and extrinsic motivation are important predictors of research interest, the lack of longitudinal data limits the extent to which inferences can be made about the impact that these variables have on research productivity. This will be discussed further in the following section.

Future Directions

The present findings offer several compelling possibilities for future research in this area. It may be worthwhile to further examine the factor structure of the RMS in additional populations within the field of psychology. To date, the RMS has been administered to students in various STEM fields, as well as clinical and counseling psychology doctoral students, but psychology students in more research-focused areas (e.g., cognitive psychology, social psychology) have not been sampled. It might be worthwhile to investigate the constructs of research motivation in areas of psychology that are generally considered to be more productive in research, and examine how the RMS scales relate to research interest in these populations. By comparing individuals from research-productive fields of psychology to the samples used in this study, light might be shed on how to address the low productivity among clinical and counseling psychology students/faculty. Another portion of the population within psychology that warrants further study regarding research motivation is minorities. To date, all studies that have used the RMS have reported low numbers of minorities within their samples (Deemer, Martens, & Buboltz, 2010; Deemer et al., in press), including the present study. As such, little is known about the differences that may exist for racially and ethnically diverse populations. To establish further support for this measure, it would be beneficial to obtain greater diversity within the samples that are studied.

Another important future direction for those studying research motivation is to obtain further evidence of predictive validity for the RMS. This study provided information about the relationship between types of motivation and research interest, but without longitudinal data regarding students' productivity after graduation, inferences cannot be made about the long-term predictive utility of the RMS. In order to learn more about how research motivation affects research interest and scholarly productivity, it is important to gather information from students both early in their graduate training and when they are working in their careers.

As was previously mentioned, results from this study provided important information about extrinsic motivation and research interest, but much more needs to be understood about this construct and how it affects intrinsic motivation. A review of the relevant literature suggests that the effects of extrinsic motivation depend on whether it undermines feelings of perceived competence and autonomy (Deci & Black, 2000; Fortier et al., 1995; Soenens & Vansteenkiste, 2005). It might be reasonable to assume that in some situations external incentives will help to bolster research interest whereas they might diminish research interest in other situations. For example, external rewards such as limited research scholarships may increase students' participation in research, while the forced competition between peers may undermine intrinsic motivation. To better understand the effects of extrinsic motivation, researchers should explore the various ways that programs reward their students and investigate the short and long term effects of such incentives.

Results from this study suggest that research motivation may serve as an important contributor to research interest in college students, but how motivation is connected to

other established predictors of research interest is not well understood. In the past several decades researchers have developed an overarching model using personality, RTE, and social-cognitive factors, such as outcome expectations and self-efficacy, to account for research interest (e.g., Kahn, 2001), and research motivation may be a large piece to this puzzle. Learning whether and how these variables work together to contribute to students' proclivity toward research may prove valuable in increasing students' research productivity during their careers.

Conclusion

In summary, the present study provided support for the three-factor model of the RMS in a sample of clinical and counseling psychology doctoral students, indicating that it is an acceptable tool to use with graduate psychology students within these populations. Additionally, the constructs measured by the RMS, particularly IR, were found to be significant predictors of research interest. The results of this study strongly suggest that research motivation, especially intrinsic motivation, contributes to psychology students' decisions to pursue research in their careers. These findings lend support to the notion that research interest is affected more by individual factors than external factors such as degree type and RTE, and have several implications for prospective students and training programs. These results have provided a wealth of information regarding the importance of research motivation variables and have laid a foundation for future studies in the pursuit to understand how students are motivated to participate in research.

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APPENDIX A
DEMOGRAPHIC QUESTIONNAIRE

1. Age: _____

2. Gender:

   Male
   Female

3. Ethnicity:

   White
   Asian/Pacific Islander
   Black
   Hispanic
   East Indian
   Aboriginal/American Indian/Alaska Native
   Other (Specify)

4. What year of your current degree program are you currently in?

   Year 1
   Year 2
   Year 3
   Year 4
   Year 5
   Year 6+

5. What is your program's training model?

   Clinical Scientist
   Scientist-Practitioner
   Practitioner-Scholar
   Practitioner
   Other (Specify)

6. What type of professional psychology program are you in?

   Clinical Psychology
   Counseling Psychology

7. What university are you currently attending? _____

APPENDIX B

RESEARCH MOTIVATION SCALE

Using the 5-point scale provided (1=strongly disagree, 5=strongly agree), please indicate the degree to which you agree with each statement.

1. Conducting research provides me with feelings of satisfaction.

2. I want to pursue less difficult research projects that I know will guarantee a successful outcome.

3. I conduct research to earn the respect of my colleagues.

4. I conduct research for the joy of it.

5. When the preliminary results of my research have not met my expectations, I want to cut my losses and move on to the next project.

6. I want to be recognized by my colleagues as a competent researcher.

7. I have a general feeling of well-being when I'm involved in research.

8. I sometimes want to avoid difficult research projects because I'm concerned that I may fail.

9. I love to learn new things through research.

10. I want to leave my mark on my field.

11. I have a need to understand scientific phenomena.

12. I want to receive awards for my scientific accomplishments.

13. I feel great pleasure when I've learned something new in my area of research.

14. I sometimes want to give up when my research is not proceeding as I would like.

15. Research in and of itself is enjoyable to me.

16. I want to focus more of my energy on other research projects when the current project I am working on is not progressing as expected.

17. I enjoy doing research for its own sake.

18. I want to avoid pursuing difficult research projects that might result in a negative outcome (e.g., lack of significant findings, not accepted for publication, etc.).

19. Time seems to fly by when I'm conducting research.

20. I want to be recognized by my colleagues for conducting sound research.

APPENDIX C

INTEREST IN RESEARCH QUESTIONNAIRE

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

1. Reading a research journal article.

2. Being a member of a research team (remember, the term research encompasses both the quantitative and qualitative approaches).

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 site of counseling practice.

8. Taking a research design course.

9. Taking a statistics course.

10. Developing a data analysis.

11. Analyzing data.

12. Discussing research findings.

13. Writing for publication/presentation.

14. Leading a research team.

15. Designing a study.

16. Collecting data.

APPENDIX D
RESEARCH TRAINING ENVIRONMENT SCALE – REVISED – SHORT FORM

Please respond to the following statements in terms of the doctoral program in which you are currently receiving your training. (Note: If you are currently on internship, please rate the graduate program in which you were previously trained).

1. Many of our faculty do not seem to be very interested in doing research.
2. The faculty does what it can do to make research requirements such as the thesis and dissertation as rewarding as possible
3. My advisor understands and accepts that any piece of research will have its methodological problems.
4. I have felt encouraged during my training to find and follow my own scholarly interests.
5. There is a sense around here that being on a research team can be fun, as well as intellectually stimulating.
6. Faculty members in my program use an extremely narrow range of research methodologies.
7. Generally, students in my training program do not seem to have intellectually stimulating and interpersonally rewarding relationships with their research advisors.
8. I have the feeling, based on my training, that my thesis (or dissertation) needs to be completely original and revolutionary for it to be acceptable to the faculty.
9. Our faculty seems interested in understanding and teaching how research can be related to counseling practice.
10. Most faculty do not seem to really care if students are genuinely interested in research.

11. During our coursework, graduate students are taught a wide range of research methodologies, e.g., field, laboratory, survey approaches.

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

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

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

15. Statistics courses here are taught in a way that is insensitive to students' level of development as researchers.

16. The statistics courses we take do a good job, in general, of showing students how statistics are actually used in psychological research.

17. It is unusual for first-year students in this program to collaborate with advanced students or faculty on research projects.

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

APPENDIX E

HUMAN USE COMMITTEE APPROVAL FORM

LOUISIANA TECH
UNIVERSITY

MEMORANDUM

OFFICE OF UNIVERSITY RESEARCH

TO: Ms. Carly Bischoff and Dr. Eric Deemer

FROM: Barbara Talbot, University Research

SUBJECT: HUMAN USE COMMITTEE REVIEW

DATE: March 23, 2011

In order to facilitate your project, an EXPEDITED REVIEW has been done for your proposed study entitled:

"Research Motivation in Professional Psychology Doctoral Students: Examination of the Psychometric Properties of the Research Motivation Scale"

***HUC 851**

The proposed study's revised procedures were found to provide reasonable and adequate safeguards against possible risks involving human subjects. The information to be collected may be personal in nature or implication. Therefore, diligent care needs to be taken to protect the privacy of the participants and to assure that the data are kept confidential. Informed consent is a critical part of the research process. The subjects must be informed that their participation is voluntary. It is important that consent materials be presented in a language understandable to every participant. If you have participants in your study whose first language is not English, be sure that informed consent materials are adequately explained or translated. Since your reviewed project appears to do no damage to the participants, the Human Use Committee grants approval of the involvement of human subjects as outlined.

Projects should be renewed annually. ***This approval was finalized on March 23, 2011 and this project will need to receive a continuation review by the IRB if the project, including data analysis, continues beyond March 23, 2012.*** Any discrepancies in procedure or changes that have been made including approved changes should be noted in the review application. Projects involving NIH funds require annual education training to be documented. For more information regarding this, contact the Office of University Research.

You are requested to maintain written records of your procedures, data collected, and subjects involved. These records will need to be available upon request during the conduct of the study and retained by the university for three years after the conclusion of the study. If changes occur in recruiting of subjects, informed consent process or in your research protocol, or if unanticipated problems should arise it is the Researchers responsibility to notify the Office of Research or IRB in writing. The project should be discontinued until modifications can be reviewed and approved.

If you have any questions, please contact Dr. Mary Livingston at 257-4315.

***NOTE: Schools should not be identified; otherwise permission of institution would be needed.**

APPENDIX F

HUMAN SUBJECTS CONSENT FORM

HUMAN SUBJECTS CONSENT FORM

The following is a brief summary of the project in which you are asked to participate. Please read this information before signing the statement below.

TITLE: Motivation and Research Interest

PURPOSE OF STUDY/PROJECT: *The purpose of this study is to examine the relationship motivation and research interest among* professional psychology students.

PROCEDURE: You will be asked to complete a brief online survey which will take approximately 10 minutes. Information that you provide in the survey will remain entirely confidential and will not require you to provide any identifying information. You are free to discontinue yoru participation of the survey at any time without penalty. At the end of this survey you will be given the opportunity to participate in a raffle for one of two $50 gift cards. Contact information for the raffle will be collected separate from the information provided within the survey.

INSTRUMENTS: In this survey, you will be asked to provide general demographic information as well as information regarding your interest and motivation toward research and the research training environment of your doctoral program. Please thoroughly follow instructions.

RISKS/ALTERNATIVE TREATMENTS: There are no known risks associated with your involvement in this research. The information that you provide will contribute to our understanding of the factors that motivate professional psychology students to do research.

BENEFITS/COMPENSATION: If you elect to participate in the raffle, you have a chance to win one of two $50 gift cards. The raffle will occur once all data for this study has been collected.

I, _____, attest with my signature that I have read and understood the description of the study, "Motivation and Research Interest", and its purposes and methods. I understand that my participation in this research is entirely voluntary. I understand that I may withdraw at any time or refuse to answer any questions without penalty. I understand that, upon completion of the study, a summary of the results will be freely available to me upon request. I understand that my survey responses will be confidential, accessible only to the principal investigators, myself, or a legally appointed representative. I have not been requested to waive nor do I waive any of my rights related to participating in this study.

_____ _____

Signature of Participant **Date**

CONTACT INFORMATION:

The principal experimenters listed below may be contacted to answer questions about the research, participant rights, or related matters:

PROJECT DIRECTOR(S): Carly Bischoff, M.A., and Eric Deemer Ph.D.
EMAIL: cmb074@latech.edu or edeemer@latech.edu
PHONE: 318-257-3413

Members of the Human Use Committee of Louisiana Tech University may also be contacted if a problem cannot be discussed with the experimenters:

Dr. Les Gunce: 318-257-3056
Dr. Mary M. Livingston: 318-257-2292 or 318-257-4315